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ABSTRACT

This annual report examines student achievement in U.S. schools, using evidence released in the previous 12 months to investigate the enormous gap between the U.S. and other nations in mathematics achievement and analyze the gap in reading achievement between the nation's best and worst fourth-grade readers. The report also explores the culture of U.S. high schools, using data from a survey of foreign exchange students that examined their impressions of U.S. high schools. Responses indicate that the culture of high schools and the low status of academic accomplishments within the teen culture may present formidable obstacles to the attainment of academic excellence. Achievement in urban schools is also analyzed. Test scores from dozens of states were collected to determine how urban school districts were doing in comparison to rural and suburban districts in the same state. The report presents scores for 39 of the 50 most populous cities in the U.S., analyzing the performance of urban districts serving a substantial number of children in poverty. It also estimates the achievement gaps that urban schools must overcome to reach parity with their rural and suburban counterparts. Report Addenda conclude the document. (Contains 42 endnotes.) (SM)

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The 2001 Brown Center Report on American Education:

HOW WELL ARE AMERICAN STUDENTS LEARNING?

With special sections on high school culture and urban school achievement

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The 2001 Brown Center Report on American Education:

HOW WELL ARE AMERICAN STUDENTS LEARNING?

With special sections on high school culture and urban school achievement

September 2001
Volume I, Number 2

by:
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Education Policy

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THE 2001 BROWN CENTER REPORT ON AMERICAN EDUCATION

Education commanded a prominent position in the 2000 campaign for president. Both candidates featured proposals for improving schools. Both talked about education on the stump, in campaign advertisements, and in televised debates. Within a few days of taking the oath of office, George W. Bush made education legislation the incoming administration's top priority. Secretary of Education designate Rod Paige stood at Bush's side as the president declared a vigorous new role for the federal government in school reform, an effort, Bush pledged, that would provide a better education for every American student and leave no child behind.

This pledge highlights a problem discussed in this report, the second edition of the Brown Center Report on American Education. The concern is with achievement gaps, the yawning disparities in achievement between the academically successful—be they students, schools, or nations—and the unsuccessful. Focusing on gaps demands that we think about achievement as not simply a phenomenon measured by test score averages. Statisticians would say that the distribution of achievement is now being taken into account. In the case of student achievement, for example, it means paying attention to the range of scores from top to bottom, the number of students performing at various levels of proficiency, and the learning differences that different scores represent. Focusing on gaps forces people to see education as a valued resource that is distributed differently to different students, inviting questions about the educational system's fundamental fairness and a sober consideration of what it will

take to ensure that students who struggle academically learn what they need to learn, of what—truly—is required so that no child is left behind.

Although varying in content from year to year, the Brown Center Report is organized by three consistent sections. The first section uses evidence released in the previous twelve months to evaluate student achievement in America's schools. This year, we investigate the enormous gap between the U.S. and other nations in mathematics achievement and analyze, in reading achievement, the gap between the nation's best and worst readers in fourth grade.

The second section explores a theme in depth. This year's theme is the culture of the American high school. A survey of foreign exchange students was conducted to get their impressions of American high schools. Responses indicate that the culture of high schools and the low status of academic accomplishments within teen culture may present formidable obstacles to the attainment of academic excellence.

The third section analyzes achievement in urban schools. Test score data from dozens of states were collected to determine how urban school districts are doing in comparison to rural and suburban districts in the same state. We present scores for thirty-nine of the fifty most populous cities in the U.S. and analyze the performance of urban districts serving a substantial number of children in poverty. The data do not allow for any firm policy conclusions or recommendations, although the most popular urban school reforms of the 1990s are briefly discussed. This section's primary objective is to estimate the achievement gaps that urban schools must overcome to reach parity with their rural and suburban counterparts.

Part I THE NATION'S ACHIEVEMENT

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AMERICAN STUDENTS MADE SOLID GAINS IN mathematics achievement in the 1990s. Reading achievement remained flat. This conclusion is based on an analysis of the National Assessment of Educational Progress (NAEP), considered by many education experts as the best measure of academic achievement in the United States.

Last year's Brown Center Report analyzed data from the NAEP trend assessment, a test oriented toward traditional curriculum content. This year's report begins by examining data from another NAEP test, the main assessment, which was first given in 1990. The main NAEP is designed to reflect contemporary ideas about reading and mathematics. It is strongly influenced by professional educator groups. Many of these organizations seek to change how reading and mathematics are taught and assessed. To keep the main assessment current with professional opinion, NAEP officials may periodically alter the test's content and procedures.[1]

How did American students do in the 1990s?

Confirming findings from the trend NAEP, reading scores remained basically unchanged on the main NAEP from 1992 to 2000 (see Table 1). Small declines in the early 1990s were offset by later gains, producing a zero net change for the decade. As a rule of thumb, changes of three scale score points or more in NAEP national averages are statistically significant.

Despite the lack of progress in reading, the scores offer a ray of hope. A modest upward slope has been in place since 1994, and if it continues, reading achievement will experience solid gains in the next decade.

Math scores shot up on the main NAEP, despite the fact that the performance of twelfth graders experienced a three point decline in 2000 (see Table 2). Not only were the decade's gains statistically significant, but they also are almost certainly of real-world importance. An estimate of one year's worth of growth between fourth and eighth grades can be made by dividing the two grades' scale score differences by four (in 1996, for example, 48 ÷ 4 = 12). The same calculation for annual growth between eighth and twelfth grades produces an estimate of about eight points. Since eighth grade is the starting and ending point of the two time frames, ten points is a reasonable estimate of growth for eighth graders, midway between that of fourth grade (12 points) and twelfth grade (8 points).

Using these estimates, it appears that students at all three grade levels have gained about one year's worth of math knowledge

Main NAEP Reading Scores (1992-2000) — Table 1

	1992	1994	1998	2000
12th grade	292	287	291	—
8th grade	260	260	264	—
4th grade	217	214	217	217

NOTE: As measured by the National Assessment of Educational Progress, for grades 4, 8, and 12. NAEP data are expressed as scale scores, ranging from 0 to 500. Eighth and twelfth grades not tested in 2000.

Main NAEP Math Scores (1990-2000)

Table 2

	1990	1992	1996	2000
12th grade	294	300	304	301
8th grade	263	268	272	275
4th grade	213	220	224	228

NOTE: As measured by the National Assessment of Educational Progress, for grades 4, 8 and 12. NAEP data are expressed as scale scores, ranging from 0 to 500.

Introduction to NAEP

The National Assessment of Educational Progress (NAEP) is commonly referred to as the Nation's Report Card. Since 1969, it has been the only nationally representative and continuing assessment of what America's students know and can do in academic subject areas. The number of students selected for a NAEP national sample for any particular grade and subject is 7,000 or more.

There are three NAEP test types: (1) the main NAEP gauges national achievement while also reflecting current practices in curriculum and assessment, (2) the long-term trend NAEP allows reliable measurement of change in national achievement over time, and (3) the state NAEP measures achievement of students in participating states. These assessments use distinct data collection procedures and separate samples of students.

Since 1990, the main and state NAEP tests have been governed by frameworks reflecting recommendations of groups advocating curriculum reform. The long-term trend test has used the same test procedures since 1971.

since 1990 (fourth and eighth graders, a little more, twelfth graders, a little less). In fact, one year's worth of gains occurred just between 1990 and 1996. Scores on the main NAEP test are rising much faster than on the NAEP trend test. On the trend, nine year olds and thirteen year olds made about a year's worth of math gains—for seventeen year olds, about a half year. These gains were from 1973 to 1999. In other words, learning gains made on the main NAEP from 1990 to 1996 equaled or exceeded gains made on the trend NAEP over twenty-six years. Scores on the main were increasing more than four times faster than scores on the trend.[2]

Why do the two NAEPs disagree?

As discussed in last year's report, the two NAEP tests measure different mathematics skills. Students are learning more in three areas of math—geometry, statistics, and problem solving—that are emphasized on the main test, while performance has remained static on the arithmetic skills emphasized on the trend. The one year's worth of math knowledge that students gained in the 1990s is largely confined to topics sparsely covered in a traditional math curriculum. So, despite the test gains, the public won't be noticing any big improvement in the computation skills of students anytime soon.[3]

Why are math scores rising while reading scores aren't?

On both NAEP tests, math gains outpace gains in reading. The best explanation for this pattern may be the obvious: that schools are doing a better job of teaching math than reading. The huge gains on the main NAEP may be due to teachers devoting more instructional time to geometry, statistics, and problem solving than in the past. The National Council of Teachers of Mathematics has certainly urged them to do so, although it is unclear how many teachers are following the advice.

But there are other considerations. The increase in non-English speaking students may have adversely affected reading scores. Moreover, many researchers believe that math achievement is more dependent on "within-school" activities and responds more quickly to curriculum change. This belief stems from evaluators' repeated observation that new reading programs have more difficulty producing demonstrable achievement gains than new math programs. As the various reforms adopted by states in the 1990s begin to kick in, it is not surprising to see improvement in math scores before reading scores.[4]

What do state tests show?

One of the most popular education reforms adopted by states in the 1990s was the creation of academic accountability systems,

It is important for discrepancies between the main NAEP and state tests to be thoroughly investigated and explained.

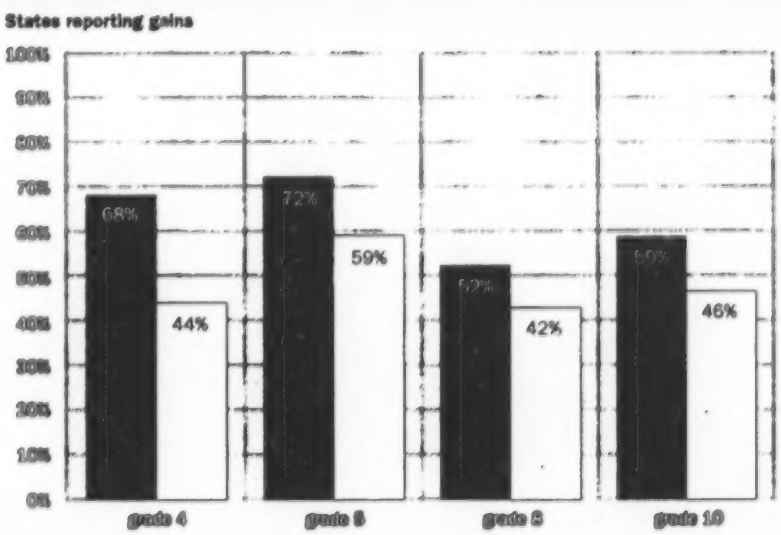
establishing incentives for both schools and students by linking rewards and sanctions to performance on state achievement tests. What do these tests show about the direction of academic achievement? We analyzed scores from several grade levels in states that gave the same test in 1999 and 2000. We found that scores in both math and reading are rising, but less than reported last year. In reading, more states exhibited gains than losses at grades four, five, eight, and ten. However, the percentage of improving states decreased from 1999 to 2000, indicating that progress may be slowing (see Figure 1).[5]

In math, achievement gains in the elementary grades also appeared to slow. The percentage of improving states decreased in fourth and fifth grades (see Figure 2). As Robert L. Linn has pointed out, it is not unusual for "plateauing" to occur after testing programs have been in place for awhile. When states and districts introduce new tests, they frequently produce large initial gains. Over time, however, as teachers and students adjust to the objectives of the test—in some cases, teachers may actually teach to the test—the gains become smaller and begin to level off.[6]

The plateauing effect is not evident in the upper grades, where more states are reporting math gains. In tenth grade, 84% of the states reported higher math scores in 2000 than in 1999, compared to 54% that reported higher scores in 1999 compared to 1998. The upward trend for tenth graders on state tests is contrary to the decline reported on the 2000 main NAEP for twelfth graders. Students enrolled in the two grades attend the same high schools. With many people proposing that NAEP serve as a check on state tests—and that federal education aid to states depend on states holding schools accountable for academic progress—it is important for

Reading gains are slowing. 1

At all four grade levels, fewer states reported gains in 2000 than in 1999.



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Math Achievement on 1999 TIMSS-R (Grade 8) | **Table 3**

Country	Score	SE
Singapore	604	6.3
Korea	587	2.0
Chinese Taipei	585	4.0
Hong Kong	582	4.3
Japan	579	1.7
Belgium (Flemish)	558	3.3
Netherlands	540	7.1
Hungary	532	3.7
Canada	531	2.5
Russia	526	5.9
Australia	525	4.8
Czech Republic	520	4.2
Malaysia	519	4.4
United States	502	4.0
England	496	4.1
New Zealand	491	5.2
Italy	479	3.8
Cyprus	476	1.8
Thailand	467	5.1
Israel	466	3.9
Turkey	429	4.3
Jordan	428	3.6
Iran	422	3.4
Chile	392	4.4
Philippines	345	6.0
South Africa	275	6.8

discrepancies between the main NAEP and state tests to be thoroughly investigated and explained. At this point, state tests are too new to have established reliable trends. For now, they should be viewed as establishing baselines of achievement.

How is the United States doing compared to other countries?

TIMSS-R stands for the Third International Mathematics and Science Study-Repeat. It replicated the 1995 TIMSS, an international study of achievement in math and science involving fourth, eighth, and twelfth graders in forty-one countries. The TIMSS-R test was given in 1999 to eighth graders from thirty-eight countries. Results were released in December 2000. Several U.S. school districts and consortia of districts also participated in the study as part of the TIMSS Benchmarking project. The Benchmark data are discussed later in this report.

The results from TIMSS-R are similar to the 1995 results. The U.S. placed near the middle of world achievement (see Table 3). Singapore had the highest scores, and Korea, Chinese Taipei, Hong Kong, Japan, and Belgium (Flemish) scored near the top.

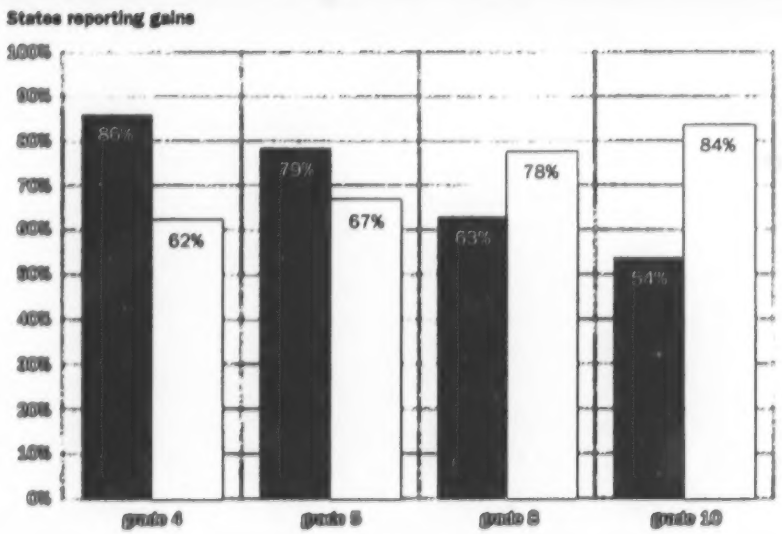
The horserace aspect of TIMSS—determining which countries score the highest—is indeed fascinating. Drawing less attention are the valuable data the test gathers on the teachers, students, and curricula of participating nations. Educators in each country are given an opportunity to describe what they do so that their practices may be compared to those of other teachers around the world. Four findings are striking, primarily because of their implications for math reform in the United States.

What do teachers think about their preparation to teach?

American teachers possess tremendous confidence in their teaching. Teachers were asked

Math gains are mixed. Fig. 2

Gains are slowing in the lower grades but accelerating in the upper grades.



how prepared they are to teach math, and responses were sorted into high, medium, and low categories. The TIMSS-R unit of analysis is students, so the study reports the percentage of students having teachers with a particular characteristic.

Eighty-seven percent of American eighth graders are taught by teachers with high confidence (see Table 4). The average for students in all countries is 63%. The highest scoring nations have fewer teachers at this level than the U.S.: Chinese Taipei, 71%; Singapore, 66%; Belgium (Flemish) 65%; Hong Kong, 61%; Korea, 48%. Japan comes in dead last at 8%. Japanese students may perennially score near the top on math tests, but Japanese teachers feel the least prepared of any teachers in the world to teach math. These puzzling statistics mirror what international studies have already discovered about American and Japanese students, suggesting that measures of confidence are strongly influenced by national culture. Although U.S. performance is mediocre to bad on international assessments, American teachers and students are at the top of the world when it comes to confidence in their own abilities. And teachers and students in high scoring nations, especially Japan, are unsure of their own proficiency.[7]

What have math teachers studied?

The confidence that American teachers express about teaching math is not related to their own extensive study of mathematics as a discipline. Among the world's math teachers, American teachers are among the least likely to have majored in mathematics in B.A., M.A., or teacher training programs (see Table 5). Most American eighth grade math teachers majored in education. Only 41% of U.S. eighth graders are taught by math majors. The international average is 71%. In the highest scoring nations, students are likely to have teachers holding math degrees: Belgium (Flemish), 89%; Chinese Taipei, 82%, Japan, 79%; Singapore, 78%. American teachers believe they are well-prepared to teach math despite the fact that they have less formal education in the discipline than teachers in other countries.

Does math instruction reflect the real world?

Many math reform groups urge teachers to anchor their instruction in real-world activities. Following this advice, recently published American textbooks emphasize solving practical math problems and de-emphasize working with notation, symbols, and abstract equations. The belief is that stressing math's practical uses will lead students to appreciate the subject's value.

Much of the world seems to have a hard time believing that math's practical utility is paramount in learning the subject. Students were asked how often they use items from everyday life to solve math problems (see Table 6). Most students answered in the middle two response categories, but examining the extremes brings international differences into focus. The U.S. eighth graders led the world on this question, with 23% saying they "almost always" solved math problems using items from everyday life and only 12% saying "never." About a two to one ratio in favor of practical applications. The pattern of responses in higher scoring nations was the reverse: Singapore, 16% almost always and 14% never; Chinese Taipei, 11% almost always and 15% never; Belgium (Flemish), 7% almost always and 27% never; Hong Kong, 6% almost always and 15% never; Korea, 3% almost always and 37% never; Japan, 2% almost always and 27% never.[8]

American math lessons stress the practical side of mathematics, more so than the rest of the world, much more so than high achieving nations. Students in high scoring nations learn a more formal and symbolic mathematics.

Teachers Expressing High Confidence in Preparation to Teach Math
(TIMSS-R, 1999, Grade 8)

Table 4

Country	% Students	Score
United States	87 (2.4)	505 (4.2)
Chinese Taipei	71 (3.6)	586 (4.5)
Singapore	66 (4.2)	603 (7.1)
Belgium (Flemish)	65 (3.2)	559 (5.8)
Hong Kong	61 (4.3)	579 (5.5)
Korea	48 (3.9)	585 (3.2)
Japan	8 (2.1)	584 (6.1)
International Average	63 (0.6)	489 (1.1)

NOTE: Standard errors appear in parentheses.

Teachers' Major Area of Study
(TIMSS-R, 1999, Grade 8)

Table 5

Country	Percentage of students with teachers majoring in: Math	Education
Belgium (Flemish)	89 (2.6)	42 (2.9)
Chinese Taipei	82 (3.7)	32 (3.6)
Japan	79 (3.6)	15 (3.2)
Singapore	78 (3.6)	48 (4.8)
Hong Kong	57 (4.2)	38 (3.8)
Korea	55 (4.2)	19 (3.2)
United States	41 (3.4)	54 (3.4)
International Average	71 (0.6)	32 (0.6)

NOTE: Standard errors appear in parentheses.

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Students' Use of Items from Everyday Life in Math Work
(TIMSS-R, 1999, Grade 8)

Table 6

	Almost Always		*Pretty Often*		*Once in a While*		*Never*	
Country	% Students	Score	% Students	Score	% Students	Score	% Students	Score
United States	23 (0.9)	489 (5.1)	31 (0.8)	509 (3.8)	34 (0.7)	515 (4.1)	12 (0.7)	493 (6.8)
Singapore	16 (0.8)	578 (7.8)	34 (0.9)	606 (6.9)	36 (1.1)	617 (6.3)	14 (0.8)	599 (6.1)
Chinese Taipei	11 (0.5)	596 (6.2)	31 (0.8)	600 (4.0)	43 (0.8)	590 (4.4)	15 (0.7)	540 (6.5)
Belgium (Flemish)	7 (0.7)	531 (13.8)	20 (0.8)	580 (4.4)	47 (1.1)	567 (4.0)	27 (1.1)	552 (4.8)
Hong Kong	6 (0.3)	573 (8.0)	24 (0.8)	583 (6.5)	56 (0.9)	587 (4.0)	15 (0.7)	570 (6.1)
Korea	3 (0.3)	580 (7.5)	12 (0.6)	602 (3.2)	47 (0.8)	595 (2.3)	37 (0.8)	573 (2.7)
Japan	2 (0.2)	—	17 (0.7)	590 (3.5)	55 (0.8)	583 (2.1)	27 (1.0)	564 (3.3)
International Average	15 (0.1)	474 (1.4)	28 (0.2)	493 (0.9)	39 (0.2)	497 (0.9)	19 (0.2)	478 (1.0)

NOTE: Standard errors appear in parentheses.

Curricular Emphasis on Reasoning and Problem Solving
(TIMSS-R, 1999, Grade 8)

Table 7

	High		*Medium*		*Low*	
Country	% Students	Score	% Students	Score	% Students	Score
Japan	49 (4.1)	584 (2.6)	45 (4.1)	574 (2.5)	7 (2.1)	562 (6.2)
Korea	21 (3.0)	588 (4.0)	66 (3.3)	586 (2.6)	13 (2.4)	594 (4.6)
United States	18 (2.5)	519 (12.4)	57 (2.9)	502 (4.1)	24 (2.7)	489 (6.4)
Chinese Taipei	13 (2.4)	571 (7.5)	58 (4.2)	594 (6.0)	29 (3.8)	573 (6.9)
Singapore	7 (2.1)	617 (25.9)	47 (4.0)	607 (8.8)	47 (4.4)	599 (8.2)
Hong Kong	6 (2.2)	597 (13.7)	56 (3.6)	591 (5.7)	38 (3.7)	570 (8.1)
Belgium(Flemish)	1 (0.4)	—	39 (3.1)	592 (4.9)	61 (3.1)	540 (5.4)
International Average	15 (0.5)	493 (3.5)	61 (0.7)	490 (1.0)	24 (0.6)	479 (1.5)

NOTE: Standard errors appear in parentheses.

One can't tell from these data if the formal study of math in other countries leads to higher achievement or if teachers in other countries are able to teach a more abstract mathematics because their students are higher achieving. But the notion that math instruction should be based on real-world tasks is certainly called into question.

Are reasoning and problem solving emphasized?

American math reformers argue that the U.S. math curriculum should focus more on reasoning and problem solving. TIMSS researchers constructed an index to measure how much teachers stress these topics. Three categories —high, medium, and low—reflect curricular emphasis. Overall, the U.S. ranks high on this measure, and two high achieving nations, Japan and Korea, rank even higher (see Table 7). Emphasizing reasoning and problem solving seems to be related to high math achievement, particularly in the U.S. American students studying a curriculum rated "high" on this dimension (scale score of 519) significantly outscore American students in the "medium" (502) and "low" (489) categories.

But Table 7 also indicates that the benefits are limited. Only 14 scale score points separate the international averages for the "high" and "low" categories of this variable. Moreover, students in high achieving nations learn much more mathematics whether reasoning and problem solving are emphasized or not. Compare the 519 scale score of U.S. students in the "high" category with students from other countries in the "low" category—Japan, 562; Korea, 594; Chinese Taipei, 573; Singapore, 599; Hong Kong, 570; Belgium (Flemish), 540. American students studying a curriculum steeped in reasoning and problem solving score well below foreign students exposed to very little reasoning and problem solving.

These gaps are enormous. If the TIMSS-R data are to be believed, the U.S. is not going to catch up with high scoring nations by using items from everyday life in math instruction or emphasizing reasoning and problem solving in the math curriculum. U.S. students who experience these reforms learn only a fraction of what students in high achieving nations learn when they do not experience them. The problem of underachievement may be rooted too deeply in American schooling to be solved by minor changes in curriculum and instruction.

NAEP and the reading gap

When the NAEP scores for fourth grade reading were released in April, 2001, officials highlighted a widening gap between the nation's best and worst readers. In the NCES press release, Gary Phillips, Acting Commissioner at the National Center for Education Statistics (NCES), reported, "Over the past eight years, we have seen a gradual widening of the gap between the reading skills of the highest and lowest performing students. In other words, the best students are reading better, while the worst students are falling further behind."

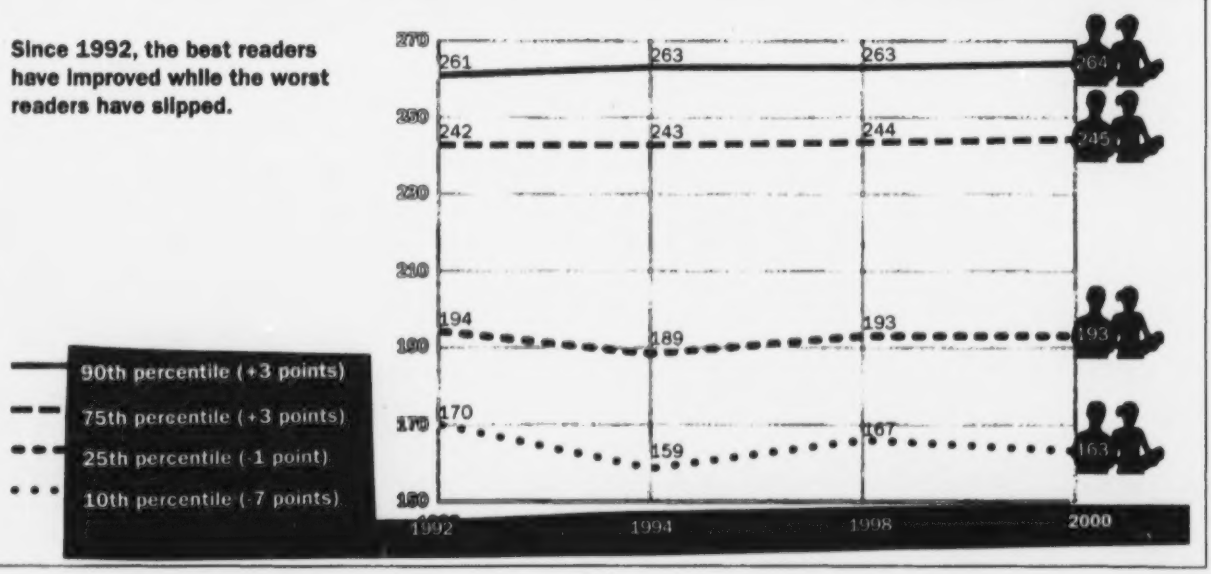
Phillips used this to explain why the national average remained unchanged from 1992 to 2000. "Although the gap between high and low performing students has widened," Dr. Phillips went on to say, "the average reading scores for America's fourth-graders have remained unchanged over the past eight years. Improvements in scores for high-performing students—those at the 75th and 90th percentiles— were offset by declining scores for low-performing students—those at the 10th percentile—so that the overall net effect was no change in the statistical average." U.S. Secretary of Education Rod Paige seconded this interpretation, noting that the results showed "the better students getting better, and the worse students getting worse."[9]

The following week, a report commissioned by the National Education Goals Panel (NEGP) and authored by Paul E. Barton made the same argument. Analyzing state by state NAEP results from 1992 to 1998, the report concluded, "Good readers are getting better at the same time weak readers are losing ground." Popular press accounts echoed this line. A *New York Times* article was headlined, "Test Results From States Reveal Gaps in Learning," and similar stories in the

Main NAEP shows a widening reading gap.

Fourth grade reading scores as measured by the National Assessment of Educational Progress (NAEP), 1992-2000.

Fig. 3



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Washington Post and *Education Week* emphasized the widening gap between high and low performing students.[10]

Commentators expressed understandable concern. Hugh B. Price of the National Urban League, stated, "These are totally unacceptable levels of movement." Amy Wilkins of the Education Trust drew a troubling conclusion: "It's frightening in that it would appear that in some ill-considered attempt to respond to the demands of higher achievement, what schools did was focus on the kids that were most likely to succeed."[11]

Is the reading gap really widening?

Let's examine the data that triggered these warnings, the 2000 main NAEP scores, and pay close attention to how scores have changed since 1992. The scores in Figure 3 are for the nation's fourth graders. The following discussion will be confined to fourth grade reading for the sake of simplicity. The main NAEP scores of better readers, those at the 75th and 90th percentiles, did indeed go up and the scores of poor readers, those at the 25th and 10th percentiles, did indeed go down from 1992 to 2000. The gap widened.

But look closer. That is only part of the story. Also clear in Figure 3 is that the bulk of the widening happened between 1992 and 1994. For the 10th-90th percentile gap, thirteen points of widening—actually, more than the decade's total amount—occurred in this single two year period. What happened? In 1994, scores fell for readers at the bottom of the distribution, especially at the 10th percentile. The gap between the 10th and 90th percentiles expanded to 104 scale score points. Since 1994, the gap has not hit 104 points again, shrinking to 101 points in 2000.

The NCES press release is misleading. Rather than showing "a gradual widening" of the achievement gap, a more accurate summary would be that the gap has fluctuated wildly since 1992, rising or falling at least five scale score points each time the test has been given. Interpreting long-term changes in a fluctuating statistic depends on the starting and end points of the time period examined. So although everything the NCES and NGEP said about trends since 1992 is true, reporting the more recent trend since 1994 would have created a starkly different impression. Consider the following true statements and imagine the newspaper coverage if they had headlined the release of either report: The achievement gap between the nation's best and worst readers reached its widest point in 1994 but has shrunk since then. From 1994 to 2000, at the same time that scores of the best readers stayed unchanged, scores of the nation's worst readers improved a statistically significant amount. [12]

In May 2000, an NCES publication concluded that NAEP scores of poor readers were improving. Note that this NCES release came only eleven months before NCES declared the performance of poor readers in decline. The 2000 report was describing progress from 1994 to 1998. It is important for the public, press, and policymakers to pay close attention to the time frames in this type of analysis. Otherwise, the wrong policies will receive blame or praise. Analysts should focus on figuring out what schools were doing that depressed poor readers' performance from 1992 to 1994. That's when the gap dramatically expanded. Contrary to the outcry when these scores were released in April, 2001, there is scant evidence on which to criticize current practice—at least when it comes to the gap between the best and worst readers.[13]

What do state NAEP results tell us about the reading gap?

The National Education Goals Panel report analyzed different data. The NCES analyzed national NAEP scores from the main NAEP

test. The NEGP study relied on data from the state NAEP tests. The two surveys administer the same test, but the two samples of students are drawn independently. So the state results offer a way to check the achievement gap using another data source.

State NAEP scores exhibit patterns similar to the national data. An analysis comparable to NEGP's, but not identical, tests the statistical significance of scale score changes at the 25th and 75th percentiles in each state.

The gap appears to have widened. But, as with the national NAEP, the entire effect is explained by changes between 1992 and 1994 (see Table 8). And, again, changes in the gap are driven by fluctuations in the scores for poor readers, those at the 25th percentile. From 1992 to 1994, not a single state showed improvement at the 25th percentile. Sixteen states experienced statistically significant declines. At the 75th percentile, three states improved, one declined, and twenty-nine were unchanged.

The situation reversed itself in the period from 1994 to 1998. The poorest readers made solid gains. Scores at the 25th percentile rose in twelve states and declined in none. The performance of good readers barely budged, with scores at the 75th percentile staying flat. Two states improved, thirty-two states showed no change, and one declined.

The state NAEP scores reaffirm the findings discussed above. The difference in performance of good and poor readers went through two phases from 1992 to 1998. The gap widened significantly during the first phase, between 1992 and 1994, largely because of a drop in scores for the bottom quartile of readers. However, the gap narrowed in the second phase, from 1994 to 1998, as the performance of poor readers improved. Scores of good readers stayed relatively stable through both phases.

What does the trend NAEP tell us about the reading gap?

A third set of data, from the long-term trend NAEP test, tells a completely different story. It contradicts the idea that the reading gap widened at all in the 1990s and furnishes compelling evidence that it actually closed. This dissenting view should be taken seriously for two reasons. First, the trend NAEP uses a different test than the other NAEPs. It places greater emphasis on basic reading skills, the most important objective of programs serving nine year olds who don't know how to read. Second, as its name implies, the trend NAEP is more appropriate than the main to draw conclusions about long-term trends. As we have seen, the gap between the 10th and 90th percentiles jumps around a lot. The trend NAEP has been given ten times in reading and the main only four, which means the trend offers more than twice as many data points to estimate "true" trends in long-term achievement. In the 1990s, the trend was given five times, the main, three (four if 2000 is included to close out the 1990s).

Figure 4 displays the trend's reading scores for nine year olds at the 10th and 90th percentiles. A clear picture emerges. The nation's top readers gained in proficiency in the 1980s while the scores of poor readers fell. The gap between the two groups reached its widest point, 116 scale score points, in 1990. Then it reversed. Throughout the 1990s, the gap steadily narrowed, falling a total of 15 points from 1990 to 1999. In almost equal measures, the narrowing was a result of poor readers' rising scores and good readers' falling scores. In 1996, the gap between the best and poorest readers hit its narrowest point since 1980.

The two NAEP tests are in conflict as to what happened to the reading gap in the 1990s. The main NAEP shows a widening gap from 1992 to 1994 and shrinkage since

State NAEP Reading Scores
(Grade 4)

Table 8

25th Percentile

	States Improving	States Unchanged	States Declining
1992–1994	0	17	16
1994–1998	12	23	0

75th Percentile

	States Improving	States Unchanged	States Declining
1992–1994	3	29	1
1994–1998	2	32	1

The two NAEP tests are in conflict as to what happened to the reading gap in the 1990s.

then. The trend NAEP indicates that the gap narrowed significantly, with most of the shrinkage occurring from 1990 to 1992. The discrepancy arises from the two tests' conflicting data on the performance of good and poor readers during the decade. According to the trend NAEP, fourth graders who struggle with reading have improved significantly since 1990. The main NAEP says their performance has declined. According to the trend NAEP, the performance of the best fourth grade readers has declined since 1990. According to the main NAEP, their performance has improved.[14]

Summary and policy implications

This section has reviewed the current state of student achievement in reading and mathematics, analyzed how the U.S. compares to other countries on several indicators pertaining to the teaching of math, and examined whether the achievement gap between high and low performing readers in the fourth grade has expanded, contracted, or remained the same.

Findings and policy implications are:

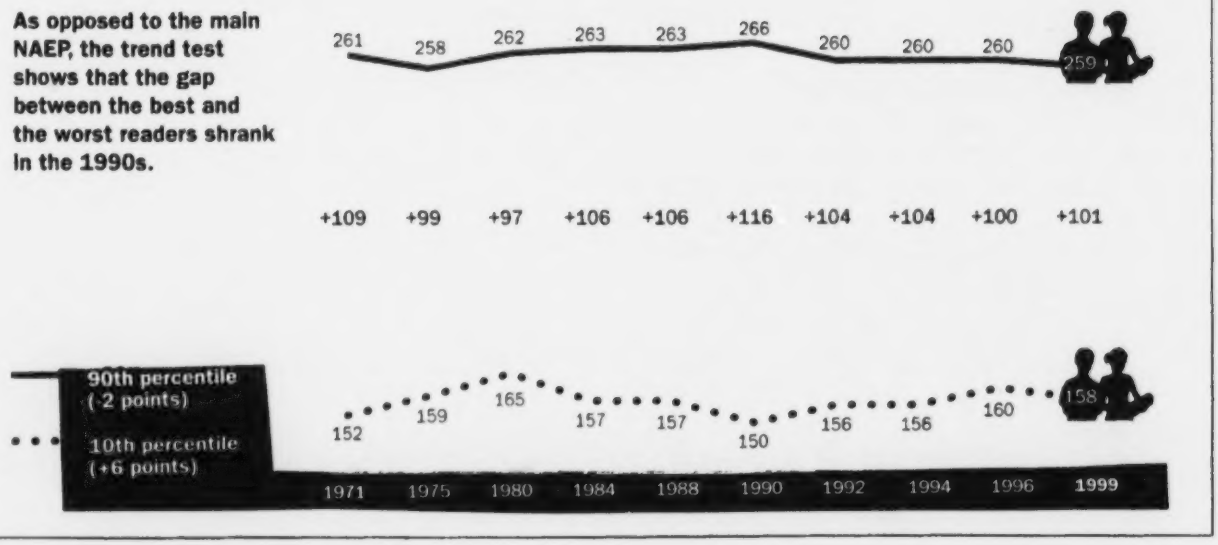
• Federal and state test data indicate that achievement in mathematics continues to improve. Reading performance is holding steady. Data conflict on two questions. The main NAEP is reporting a much faster rate of improvement in math than the NAEP trend test. And the 2000 main NAEP shows a decline in twelfth grade math skills at the same time state tests are reporting improvement in tenth grade. Federal officials should clearly explain the differences in the content of the NAEP math tests. And, as more state tests come online, discrepancies between state tests and the NAEP assessments should be pinpointed and thoroughly researched.

The trend NAEP tells a different story.

Age 9 reading scores as measured by the National Assessment of Educational Progress (NAEP), 1971 1999.

Fig. 4

As opposed to the main NAEP, the trend test shows that the gap between the best and the worst readers shrank in the 1990s.



• The U.S.'s international ranking in eighth grade mathematics stayed about the same on TIMSS tests conducted in 1995 and 1999, near the middle of the pack. Eighth grade American math teachers express confidence in their teaching despite having studied less mathematics than other teachers around the world—and considerably less than teachers in high achieving countries. In their math lessons, American students are more likely to use items from everyday life and to focus on reasoning and problem solving than students in most other countries. These practices are of limited benefit. Although the data demonstrate correlation, not causation, they suggest that making sure teachers are well educated in mathematics may yield greater payoffs than altering a few classroom practices.

• The gap between high and low performing readers is not as clear-cut as concluded by two influential reports released in 2001. Again, there is a conflict between the two NAEP tests. The main NAEP shows the reading gap expanding. The trend NAEP shows it contracting. In reading, as in math, officials should explain the differences in the two NAEPs and how those differences affect the interpretation of achievement trends.

• In both reading and math, the trend tests favor traditional content. The main favors contemporary notions of how the two subjects should be changed. In reading, for example, the main reading test asks more situational and contextual questions than the trend. It also asks questions requiring extended, written responses rather than the trend's multiple choice questions. The main NAEP might ask students to compare the character of a story to another character they've encountered in movies, in books, or on television. Questions of this type rely on knowledge external to the test's reading passages and tap writing skills as much as reading. The trend, on the other hand, more often asks students to identify the correct meaning of words. It is more likely to pose comprehension questions directly related to the passages that the student has read on the test. The trend test is more self-contained.

Federal officials considered halting the NAEP trend tests in the late 1990s. Fortunately, they didn't. As this report shows, giving two different tests requires that conflicting data from the two instruments be reconciled. In one respect, that inconvenience is a strength, not a weakness. Only by having two tests can it be determined how students are doing on both traditional content and the content reformers want schools to teach.

Part II

HIGH SCHOOL CULTURE

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A RULE OF INTERNATIONAL MATH ASSESSMENTS is that the older the students tested, the worse the United States performs. American fourth graders do the best, scoring in the upper third of nations, eighth graders score near the middle of the pack, and high school seniors fall significantly behind the rest of the world. Why is this? An observer in a unique position to shed light on this question is the foreign exchange student. By having personally experienced American high schools up close, foreign exchange students can offer insights about American teenagers and American high schools that might otherwise be overlooked.

With the cooperation of AFS (formerly the American Field Service), the Brown Center conducted a survey of foreign exchange students in U.S. high schools during the 2000-2001 academic year. After AFS provided us with a list of 2,200 students, we randomly drew a sample of 500 and administered a short survey by mail. Questions focused on comparing high school culture in the U.S. and abroad, especially the beliefs and activities of teens known to affect academic performance. Completed surveys were received from 368 students, about 73%. This is a terrific return rate. We also over-sampled students from five high achieving nations on TIMSS: France, Sweden, Russia, Hong Kong, and Japan. The return rate for the sample of high achieving nations was also high, about 76%.

The response rates make us confident that the survey findings are an accurate reflection of opinions in both samples. However, exchange students are almost certainly not representative of their countries' students as a whole. Although we collected very little personal information from the students, it is safe to assume that they are excellent students, probably from families with above average wealth, attended U.S. schools that are above average in performance, and, while in the U.S., enrolled in classes designed for high achievers. The survey's findings should be considered only applicable to the sampled population, foreign exchange students in the AFS's program. We are currently surveying American students in the AFS program who have attended high schools in other countries—

the most logical comparison group—but that study won't be completed until the winter of 2001.

Before discussing the results, some historical background is in order.

The study of teens

Just about everyone who writes about high schools eventually writes about high school students. In part, this is because a school's accomplishments are registered in the changes it causes in students. It's also because of adult society's endless curiosity about teens. The interest ranges from the trivial—what they eat, the music they listen to, the clothes they wear—to the serious—their values, the people they admire, what they hope to accomplish in life. Today, interest in teen culture is high, mirroring demographic trends. High schools enrolled approximately 15 million students in 2001, with about 13.6 million students in public schools and 1.4 million in private schools. By 2005, high schools will add at least a million more students, surpassing the previous peak of 1976, as the children of baby boomers and recent immigrants reach high school age.[15]

Historically speaking, scholarship on high school students is relatively new. Imagine visiting a medium-sized American town in 1880. You probably wouldn't have found a high school there. The few hundred that existed nationwide were primarily located in large cities. Less than one in ten youngsters of high school age attended school, and those who did went an average of only eighty-six days annually.[16]

You wouldn't have asked about teenagers. The term wasn't invented until the middle of the twentieth century. In fact, in 1880 most questions about adolescence would have elicited blank stares. Adolescents weren't considered a distinct group because adolescence wasn't considered a distinct developmental period. More than 70% of the U.S. population lived in rural areas. Children worked on farms or in small shops, learned how to make a living in the family, and shortly after the onset of puberty, became adults. The time between childhood and adulthood was too fleeting to be thought remarkable. A significant number of young men and women were parents themselves before they reached twenty years of age.[17]

Forty years later, everything had changed. We know how teenagers lived in the 1920s from the intricately detailed descriptions of life in Middletown, the landmark study of a Midwestern town by Chicago sociologists Robert and Helen Lynd. Four decades of surging high school enrollments meant that huge groups of adolescents now spent most of the day together, segregated from families and the adult world, an arrangement unheard of in agrarian society. In the chapter, "School 'Life,'" the Lynds describe Middletown's high school of 2,000 students as "a fairly complete social cosmos in itself." The formal instruction provided by teachers and other adults was contrasted with the informal instruction of the school's social life. "This informal training is not a preparation for a vague future that must be taken on trust, as is the case with so much academic work; to many of the boys and girls in high school this is 'the life,' the thing they personally like best about going to school."[18]

Yearbooks trace the trajectory of the school's social and academic missions. The first edition, published in 1894, featured the senior class and the school's faculty members, along with descriptions of course offerings. By 1924, "athletics shares the position of honor with the class data, and a faculty twelve times as large occupies relatively only half as much space."

In the 1950s, another sociologist, James S. Coleman, studied high schools and

Coleman found that youngsters' admiration for academic accomplishments begins to wane immediately after entering high school.

warned about the formation of these mini-societies. In retrospect, Coleman's 1961 book, *The Adolescent Society*, appeared on the scene like a skunk at a picnic. The post-WWII baby boom was in full swing, Hollywood churned out motion pictures celebrating youth, Doctor Spock's baby books climbed to the top of best-seller lists, and consumer products in the U.S. were increasingly pitched to a youth-oriented market.[19]

Coleman found that youngsters' admiration for academic accomplishments begins to wane immediately after entering high school. For males, social rewards in the typical American high school are allocated on the basis of athletic prowess, not academic excellence. In interviews with students, Coleman discovered that the typical high school social system judges hard work and effort differently in different pursuits, that "the boy who goes all-out scholastically is scorned and rebuked for working too hard; the athlete who fails to go all-out is scorned and rebuked for not giving his all." Acceptance of peers assumes special urgency in adolescence. Adults, not teens, are responsible for the anti-intellectualism of teen culture. As Coleman stated, "The norms of the system are created in large part by the activities to which it is subject. And it is the adult community that fixes the activities of the adolescent community."[20]

A cautionary note was struck again when Laurence Steinberg led a team of researchers that studied 20,000 American high school students in the 1980s and 1990s. Steinberg argued that school reformers, despite more than a decade of strenuous effort, had failed to significantly improve American education by doing exactly what Coleman had urged them not to do—ignore teen culture. The 1996 book, *Beyond the Classroom*, carefully documented how teens spend their time. The average teen devotes about five hours each week, less than 10% of waking, out-of-school time, to homework or studying. Three activities absorb the most time—extra-curricular activities (including sports), hanging out with friends, and part-time jobs.[21]

These activities seep into school life and weaken the press for academic excellence. For individuals, an excessive commitment to any of them drives down academic achievement. Parents and employers, Steinberg pointed out, undermine school achievement by tolerating, sometimes even actively supporting, excessive time spent on sports, friends, and jobs at the expense of fulfilling academic responsibilities. Tinkering with the structure of high schools by adding time to the school day or making coursework more difficult will have no effect, Steinberg concluded, until adults more aggressively guide teen culture towards intellectually productive ends.

The 1990s research of Barbara Schneider and David Stevenson closed out the twentieth century by producing a book-end to the Lynds' findings from Middletown. The century had begun with teens flocking to high schools. The century ended with near universal high school attendance and high school graduates flocking to colleges. In *The Ambitious Generation: America's Teenagers, Motivated But Directionless*, Schneider and Stevenson focused on the mismatch between teens' post-secondary ambitions and their plans for accomplishing them. Almost all teens want to attend college and enter a profession, but they have no idea of the skills and knowledge required to do so. In some cases, students overestimate what they need to learn to realize their ambitions; in other cases, they underestimate and fail to take courses that would even minimally prepare them for college. Like researchers before them, Schneider and Stevenson found schools, parents, and peers all important influences on students. But, sadly,

these influences often reinforce the "present-mindedness" of high school students rather than pointing them toward the future.[22]

These studies span several decades and involve tens of thousands of students. A common thread runs through the literature. Schools influence students. But causality also points in the other direction. The survey that the Brown Center conducted of foreign exchange students proceeds from this latter assumption, that students play a significant role in creating the cultures that give schools unique identities. Foreign students who have attended American high schools may help to explain why the U.S. perennially underachieves on international assessments. Or, to phrase the comparison more positively, the findings may help to explain why high school students in many Asian and European nations always do well on tests of academic knowledge.

In a nutshell: they work harder and care more. The answers to four questions support this conclusion.

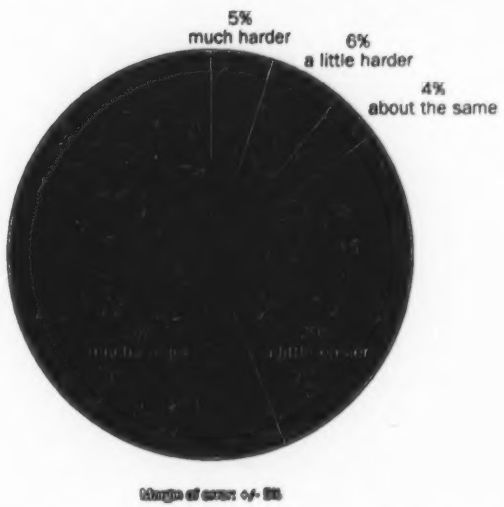
How do American classes compare?

Overwhelmingly, the foreign exchange students found U.S. classes easier than classes in their home countries (see Figure 5). More than half, 56%, described the U.S. classes they attended as much easier and 29% as a little easier. In contrast, only 5% found U.S. classes much harder and 6% a little harder. Even considering that exchange students are excellent students, as noted above, while in the U.S. they usually attend above average schools and take the toughest classes that American high schools have to offer. Compared to the classes they are familiar with back home, which probably serve high achieving students, the American classes do not seem very rigorous.[23]

American classes are easier.

Fig 5

The survey asked foreign exchange students to compare their U.S. classes to classes in their home country.



It's clear that students from the highest achieving countries in Europe and Asia regard American high schools as less demanding.

This perception is widespread among students coming from our subsample of high scoring countries on TIMSS. The percentage of students describing American classes as much easier: Sweden 55%; Hong Kong, 60%; Japan, 61%; Russia, 67%; France, 73%. It's clear that students from the highest achieving countries in Europe and Asia regard American high schools as less demanding. How American students use their time may be one reason they think so.

Do American students spend as much time on schoolwork?

We asked exchange students to compare the amount of time U.S. students and students in their home countries devote to schoolwork. More than a third, 34%, said U.S. students spend much less time on schoolwork, and 22% said a little less time (see Figure 6). This compares with 11% who felt that Americans spend much more time on schoolwork, and 14% who believed the U.S. students' time commitment was a little more. No shock here. The figures reaffirm other surveys of international study habits. American students don't spend as much time on studying—either in school or at home—as kids in other countries. The exchange students provide an interesting, counter-intuitive caveat to this finding, however. It isn't simply more homework that makes a difference. The survey inquired about the frequency of math homework. Estimates of how often math homework is assigned in the U.S. and abroad are almost identical (see Figure 7). Almost half of the exchange students, 47%, said homework is assigned everyday in their U.S. schools; 42% said it's assigned everyday at their home schools. About 34% said math homework is assigned three or four times a week in U.S. schools, and 37% gave the same estimate for schools in their home countries.[24]

American students don't spend as much time on schoolwork. Fig. 6

Exchange students were asked: "Compared to students in your home country, do you think U.S. students spend more, less, or about the same amount of time on schoolwork?"

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American students don't spend as much time on studying—either in school or at home—as kids in other countries.

How can American kids spend less time on schoolwork but have homework assigned just as often? Speculation is warranted here. Consistent with courses being easier, U.S. homework may be as frequent but take less time to complete. It could also be that students abroad spend more time preparing for class, studying for tests, and reviewing material previously covered, activities of good students that go beyond completing assigned homework.

It's important to note that such activities are self-initiated. And in good schools, they aren't considered extraordinary. Students are assumed to do them—by teachers and by other students. It's what good students do. That is what is meant by a strong academic culture. Students at high achieving schools share values and beliefs that support academic striving. High achieving countries do too. It is evident in the way kids from different countries treat non-academic activities that may interfere with their responsibilities as students.[25]

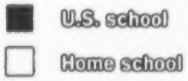
Do American students value academic success?

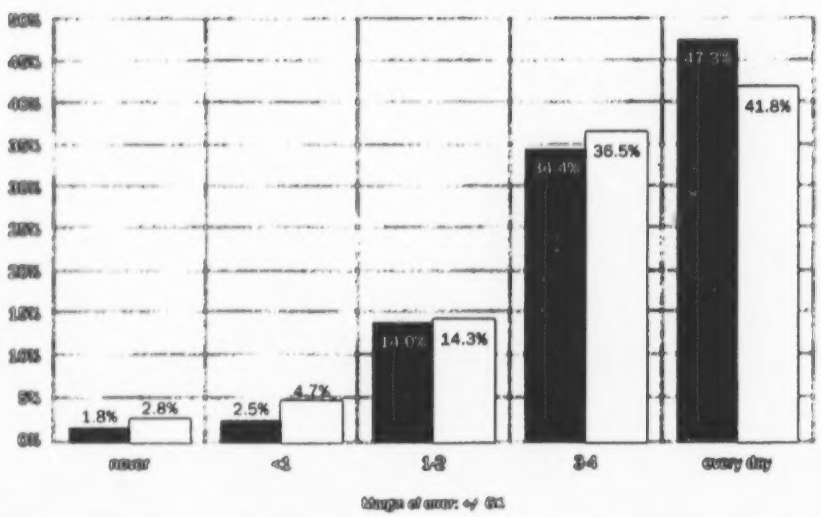
We asked the exchange students to compare their friends in the U.S. and students back home on the importance of doing well in math. Then we asked them to make the same comparison for doing well in sports. As shown in Figure 8, the exchange students don't believe American students value success in mathematics as much as kids in their home countries. Almost half (17.5% + 27.1%=45%) said U.S. students place less importance in the subject, as opposed to only 14% saying math is more important in the U.S. Doing well at math is a core value of high school students elsewhere in the world. This is especially true for high achieving nations, with Russia, Japan, and Hong Kong standing out. The percentage of

Math homework is assigned with equal frequency in the U.S. and abroad.

Fig. 7

Exchange students reported how many days per week math homework was assigned at their U.S. school and at their home school.





students saying that math is less important to U.S. students: France, 46%; Sweden, 51%; Russia, 63%; Japan, 69%; Hong Kong, 84%.[26]

The pattern is starkly different for athletic accomplishments. Exchange students view success in sports as a top priority of American high school students. How important? The numbers are lopsided (see Figure 9). More than two-thirds of exchange students report that success in sports is much more important to their American friends than to students in home countries. Another 18% say a little more important. As mentioned above, in Coleman's study in the 1950s, athletes commanded the top status positions among peer groups in typical American high schools. In the eyes of students from other countries, the paramount importance of sports persists to this day.

Teen employment in the U.S. also differs from other countries. Most American teens hold down part-time jobs. A recent federal government study of high school seniors concluded that the final year of high school is essentially wasted time, devoted more to non-academic activities than to learning. Employment is one of the culprits diverting seniors' attention from academics, even among students headed for college. In a fall 2000 survey of college freshmen, only 26% said they had not worked during a typical week of their senior year in high school. This distraction does not exist in other countries. More than 70% of exchange students said they don't work during a normal school week at home (see Figure 10). The percentage of non-working students was greatest in high achieving countries: Japan, 74%; Sweden, 76%; France, 88%; Hong Kong, 91%; and Russia, 93%.[27]

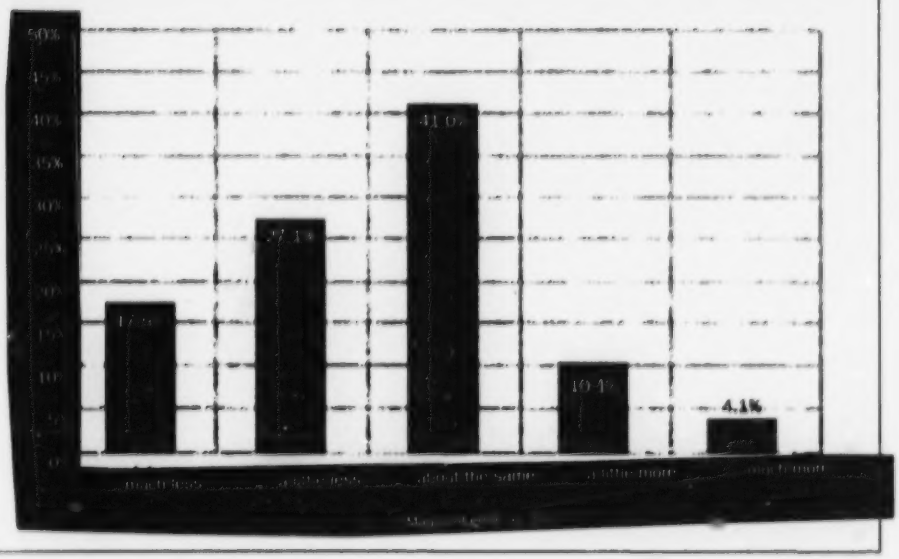
Compared to the rest of the world, why do American teens spend so much time on

A recent federal government study of high school seniors concluded that the final year of high school is essentially wasted time, devoted more to non-academic activities than to learning.

Success in math means less in the U.S.

Fig. 8

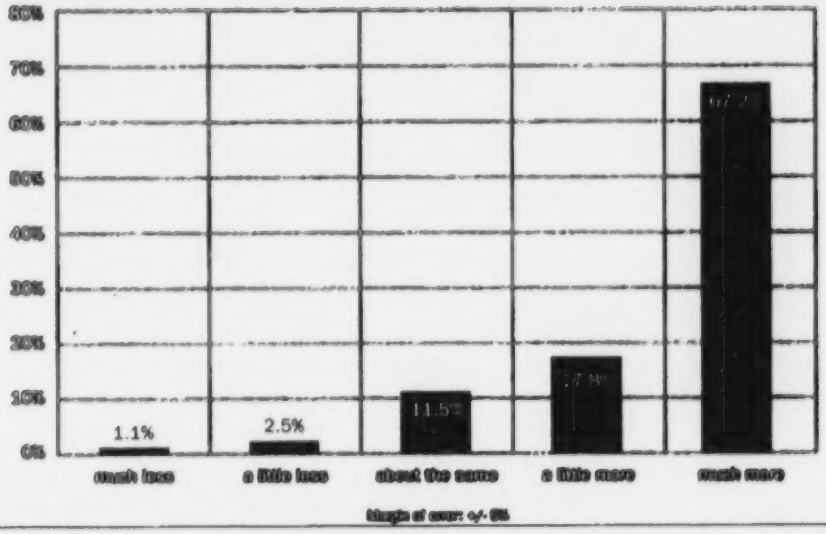
Exchange students were asked, "Compared to students in your home country, how important do your U.S. friends think it is to do well in math?"



Success in sports is dramatically more important in the U.S.

Fig 9

The survey asked, "Compared to students in your home country, how important do your U.S. friends think it is to do well in sports?"



Exchange students aren't distracted by part-time jobs.

Fig 10

Students were asked, "During a normal school week in your home country, how much time before and after school do you usually spend working at a paid job?"

part-time work? And why do they value success in sports more than success in mathematics? Clues may be found in the fundamental reasons why students go to school.

Why do students go to school?

We presented a list of reasons why young people go to school and asked the exchange students to rate each one on their importance to young people in the U.S. and abroad. As shown in Figure 11, learning core subjects—math, science, literature, and history—is far more important internationally than in the U.S. This is an American problem, not a teen problem. Americans tend to dismiss the traditional justification for a liberal arts education, that learning for the sake of learning is a virtue, celebrating education's practical value instead.[28]

But Figure 11 also reveals an irony. American high school students perceive only ambiguous connections between high school and the world of work. As Schneider and Stevenson found in their study, American students probably cannot identify the specific skills and knowledge needed for most occupations nor the high school courses in which these skills and knowledge are taught. American students may also believe that the so-called "soft skills," non-academic skills that are important to employers (for example, teamwork, following directions, punctuality) are learned through part-time employment. Students elsewhere in the world believe that high school prepares them for an occupation and see intellectual development as central to the task. Perhaps the notion that a solid grounding in intellectual disciplines opens the door to most professions is more explicitly visible in the larger, national culture of other nations.

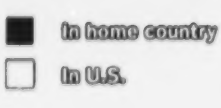
Students elsewhere in the world believe that high school prepares them for an occupation and see intellectual development as central to the task.

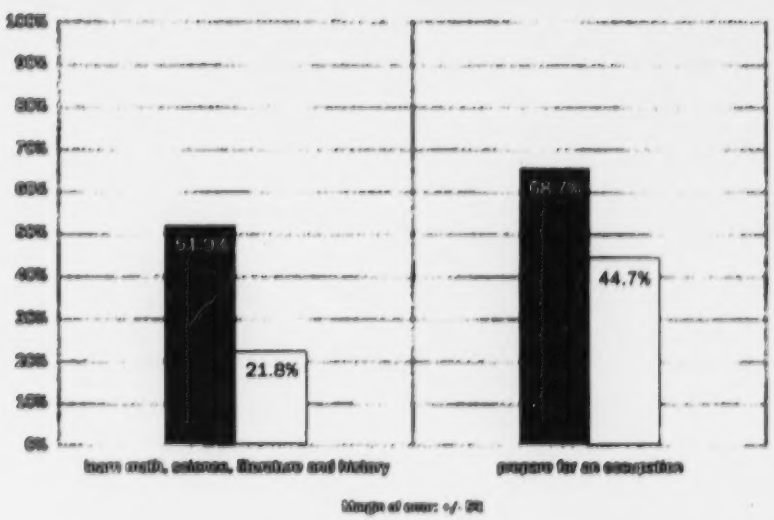
American and exchange students differ on why they go to school.

Students were asked to rate each reason as "very important," "somewhat important," or "not important."

Fig. 11

Much higher percentages of the sample said that intellectual development and career preparation were "very important" to foreign students than to their American counterparts.





Reshaping the American high school's culture will not require teenagers to stop acting like teenagers.

Figure 12 displays two areas in which the exchange students think American and students abroad are alike. Worldwide, teens are social animals. Seeing friends is a universal reason for going to high school and it need not interfere with academic excellence. The position of high school as a stepping stone to college is also widely acknowledged. These areas of similarity are encouraging. According to exchange students, the "hallway" life of other nations' schools really isn't very different. Reshaping the American high school's culture will not require teenagers to stop acting like teenagers.

Summary and conclusions

Students from abroad see American high schools as less focused on academic accomplishments than schools in their home countries. They don't believe that American students work as hard as students elsewhere in the world. American students don't seem to care as much about learning academic subjects such as mathematics. They seem to care more about success at sports. Most American high school students hold down part-time jobs. Internationally, the vast majority of high school students do not. American students are also less aware of how experiences in high school are related to their occupational aspirations. But, like students in other countries, American students are very aware of high school's importance in getting into college. And, like teens everywhere, they enjoy being with their friends.

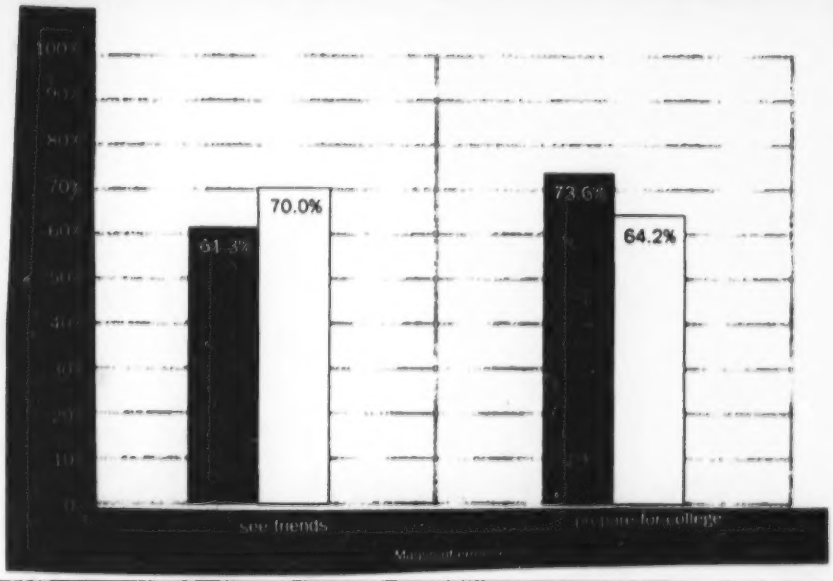
This portrait may be unduly harsh, exaggerating the non-intellectual side of U.S. education. A survey that asks teenagers to compare their home country to another is bound to stir some national pride, perhaps even chauvinism. Because of the passage of time, exchange students may remember their home schools as more challenging than they really are, something akin to absence making the

But there are two areas of agreement.

Students were asked to rate each reason as "very important," "somewhat important," or "not important."

12

Both U.S. and exchange students see social life and college preparation as "very important" reasons for going to school.



In home country

In U.S.

heart grow fonder. Homesickness may even play a part. These influences will become clearer when survey data from the U.S. students abroad are analyzed. If they are real, the same effects should show up there and work in favor of how U.S. schools appear.

That said, it would be a mistake to dismiss these findings. In the hundreds of surveys returned to the Brown Center, there was no indication that the exchange students had an axe to grind or that they had anything but fondness for the United States, their American schools and teachers, their host families, and the friends that they have met here. The survey asked them to make certain comparisons and estimates. They did that without rancor. These are the impressions of friends. They should be taken at face value.

Another plausible response to these findings is to accept their validity but dismiss them as irrelevant. Teaching academic subjects has always been a central goal of American schooling, but not the only one. American parents want their children to be "well-rounded." Knowledge is important, but so are social skills and the ability to get along with others, high ethical standards, creativity, a commitment to democracy and the welfare of communities, and sound practical judgment. Harvard psychologist Howard Gardner, writing in reaction to the U.S.'s disappointing scores on yet another international assessment, argued that there is too much national hand-wringing over how American students rank on such tests. Whether one considers the low status of academic pursuits a defect of American schools depends on the importance attributed to academic accomplishments in the first place.[19]

The portrait painted by this survey is consistent with the findings of decades of research on American adolescents and high schools. Experts have also described the changes individuals can make to alter the situation. Policies may help, but only if they encourage changes in individual behavior that produce shifts in culture. Teens can work harder and spend more time on schoolwork. Schools can expect more and structure the school environment around intellectual accomplishments. Parents can closely monitor their children's academic progress and discourage activities that interfere with learning. Employers can stop hiring teenagers to work part time during the school year, especially on school nights. All American adults who interact with teens, including producers of pop culture, can stress the fundamental importance of improving one's mind, not only because it's the key to living a productive and fulfilling life, but for its intrinsic worth.

Dramatically changing American teen culture requires that academic learning become a greater priority—for teenagers, of course, but also for parents, for educators, for employers, and for American society as a whole.

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Part III URBAN SCHOOL ACHIEVEMENT

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THIS SECTION INVESTIGATES ANOTHER ASPECT OF education that worries Americans, the low achievement of urban school systems. It first explores how differences in reading achievement between urban and suburban students are related to achievement gaps among racial/ethnic groups and families of different economic status. It also reviews the performance of several urban and suburban districts that participated in the TIMSS Benchmark study, which compared American math achievement to the achievement of other nations. The section then presents achievement data from big city school districts and other urban districts across the country to find out how they score relative to state averages. That analysis is based on both reading and math scores.

A warning up front: the report does not identify policies and practices for improving urban school systems. It takes the first step toward that objective by presenting the best available evidence on how individual urban systems are currently performing. Until we can identify which systems are succeeding and failing—and then link those outcomes to specific programs and policies—solutions to the problems of urban education will remain theoretical. Note too that school systems are the unit of the analysis. From time to time, success stories circulate about failing schools that have been turned around by dynamic educators or new programs. Credible evidence of entire systems being turned around is sparse to nonexistent. The report concludes by discussing current policies targeted at improving urban education, but this is only to give readers an idea of prevalent approaches, not to endorse one policy over another. Much more evidence of effectiveness is needed for that.

What has happened to achievement gaps related to race and ethnicity?

A dramatic success story of the past three decades has been the rising achievement of African-American and Hispanic students.

Black-White and Hispanic-White Gaps in Achievement, Main NAEP Reading Scores
(Grade 4, 2000)

Table 9

	Black-White	Hispanic-White
National	33	29
Suburbs	28	26
Non-Free Lunch	22	19

NOTE: Reported in scale score points.

Reading achievement for black and Hispanic students improved markedly in the 1970s and 1980s (see Figure 13). The score differences between white nine year olds and both black and Hispanic nine year olds narrowed steadily until 1988. Since then, however, these gaps have bounced around. They generally widened, with the notable exception of significantly narrowing in 1996. From 1988 to 1999, at the same time reading scores for white students rose by three scale score points, Hispanic scores dipped one point, and African-American scores fell by three. Hispanic and black scores suffered a decline from 1988 to 1990 that is more than the entire loss of the eleven year period.[xx]

What can we do to close these gaps? Approximately 60% of African-American and 40% of Hispanic fourth graders attend schools located in central cities. Black and Hispanic reading achievement will start rising again if urban schools are improved, but not by as much as many people think. It is true that urban schools under-perform their counterparts in suburban and rural areas. And, yes, the black-white and Hispanic-white test score gaps are smaller in suburban schools. But wide achievement differences still exist there.

What would happen to racial/ethnic achievement gaps if all schools were suddenly made to look like schools in the suburbs? The 2000 NAEP fourth grade reading scores allow for ballpark estimates. Scores are reported for three locations: central city, urban fringe/large town, and rural/small town. The "urban fringe/large town" category is considered analogous to suburbs.

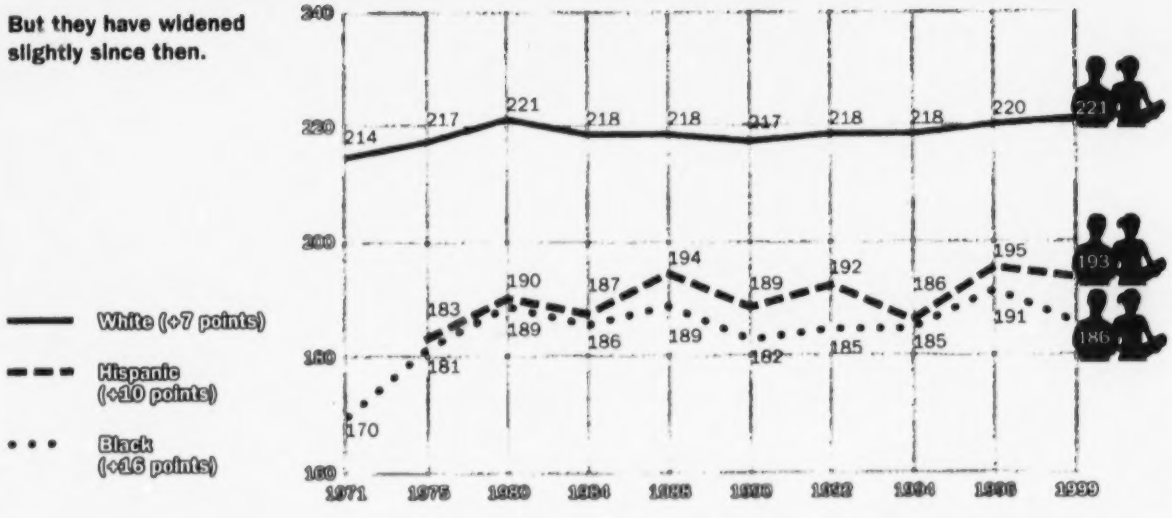
The national black-white gap is 33 scale score points. It is 28 points in urban fringe/large towns (see Table 9). This suggests that if every school in the country were suddenly transformed into a suburban school, the

The race/ethnicity gaps narrowed from 1971-1988...

Age 9 reading scores as measured by the National Assessment of Educational Progress (NAEP) trend test, 1971-1999.

Fig 13

But they have widened slightly since then.



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black-white gap would shrink by only 5 points, a reduction of 15%. The Hispanic-white gap would decrease from 29 points, the current national gap, to 26 points, the gap in the suburbs. This is a decline of about 10%. Admittedly, the "urban fringe/large town" classification is a crude proxy for suburban location, but it's doubtful that classifying schools with more precision would overthrow the principal insight here. In terms of immediate impact, equalizing urban and suburban schools would probably make only a small dent in achievement gaps related to race and ethnicity.

Reducing poverty would make a bigger difference. The free and reduced lunch program serves children from poor families. Among children who do not qualify for the free and reduced lunch program—in other words, children from families above the poverty line—the black-white test score gap is 22 points, one-third less than the 33 point gap between all black and white fourth graders. The Hispanic- white gap for non-qualifiers of the free lunch program is 19 points, also about 33% less than the 29 point gap for all Hispanics and whites nationwide. Non-free lunch students in the suburbs outscore non-free lunch students in the central city by 5 points, a gap that is 62% less than the urban-suburban gap of 13 points across the nation (not shown in table).

Please note that these "back of the envelope" calculations are not the same as controlling for inequalities in income. Families that do not qualify for free lunch range from those barely above the poverty line to those living in mansions. The category is so broad as to dramatically understate the correlation of family income to achievement. Caroline Hoxby reports that family variables—parent income, education, race, ethnicity, and involvement with school, etc.—account for about 93% of the explained variation in twelfth grade math achievement in the National Educational Longitudinal Survey (NELS). Hoxby cautions that this does not mean that schools are helpless. The family variables include characteristics that good schools are able to exploit to boost learning. Also bear in mind that equalizing the quality of urban and suburban schools could unleash several long-term benefits: high achieving urban youngsters in private schools returning to the public system, parents staying put who now move out of cities in search of better schools, urban taxpayers adopting more generous attitudes toward school funding, and excellent teachers with several job offers choosing to teach in urban classrooms.[31]

How do urban districts compare internationally?

The TIMSS Benchmark study, released in April, 2001, provides an international yardstick for measuring achievement. Several states, school districts, and consortia of districts volunteered to take the TIMSS-R assessment, a math and science test given to eighth graders in dozens of countries around the world in 1999. The U.S. as a whole scored slightly above the international average. Districts in the U.S. were a mixed bag. Students in Naperville, IL and the First in the World Consortia, a group of well-to-do districts in suburban Chicago, scored at very high levels, with about 90% of students meeting the median world benchmark for math proficiency (see Table 10). This is comparable to the performance of students in Singapore, Japan, Korea, Hong Kong, and other high achieving countries.

At the other end of the spectrum, three urban districts, the Miami-Dade, Rochester, and Chicago school districts, scored at about the same level as Thailand, Tunisia, and Iran. The data spotlight the vast differences in achievement within the U.S. The gap between the lowest and highest performing

International Perspective on U.S. School Districts' Math Achievement — **Table 10**

Percentage of 8th graders reaching TIMSS-R median international benchmark

School District	% of Students
Singapore	93
Hong Kong	92
Korea	91
Naperville School District #203, IL	91
Japan	89
First in the World Consortia, IL	87
Belgium (Flemish)	85
Michigan Invitational Group, MI	77
Montgomery County, MD	77
United States Average	61
International Average	50
Jersey City Public Schools, NJ	48
Israel	47
Thailand	44
Chicago Public Schools, IL	41
Rochester City School District, NY	32
Tunisia	32
Miami-Dade County Public Schools, FL	29
Iran	25
Indonesia	22

Median Benchmark

Students can:

- apply basic mathematical knowledge in straightforward situations;
- add or subtract to solve one-step word problems involving whole numbers and decimals;
- identify representations of common fractions and relative sizes of fractions;
- solve for missing terms in proportions;
- recognize basic notions of percents and probability;
- use basic properties of geometric figures;
- read and interpret graphs, tables, and scales, and understand simple algebraic relationships.

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Achievement in the Nation's Top Fifty Cities, 2000
Rank-ordered by City Population
(Scores on State Tests)

Table 11

City	State	School District	Z-Score	% Free Lunch	% Black + Hispanic	City Population Rank
New York City	NY	New York City Public Schools	-2.40	0.58	0.74	1
Los Angeles	CA	Los Angeles Unified School District	-1.31	0.73	0.82	2
Chicago	IL	Chicago Public Schools	-2.29	0.56	0.86	3
Houston	TX	Houston Independent School District [1]	-1.02	0.60	0.86	4
Philadelphia	PA	School District of Philadelphia	-3.38	0.42	0.75	5
San Diego	CA	San Diego Unified School District	-0.25	0.64	0.50	6
Phoenix	AZ	Paradise Valley Unified District [1]	1.44	0.16	0.10	7
San Antonio	TX	San Antonio Independent School District [1]	-2.23	0.80	0.94	8
Dallas	TX	Dallas Independent School District	-3.18	0.65	0.86	9
Detroit	MI	Detroit Public Schools	-1.42	0.64	0.93	10
San Jose	CA	San Jose Unified School District	0.00	0.43	0.51	11
San Francisco	CA	San Francisco Unified School District	0.25	0.65	0.38	12
Indianapolis	IN	Indianapolis Public Schools	-2.64	0.64	0.59	13
Jacksonville	FL	Duval County Public Schools	-0.41	0.38	0.42	14
Baltimore	MD	Baltimore City Public School System	-2.73	0.65	0.85	16
El Paso	TX	El Paso Independent School District [1]	-1.03	0.59	0.80	17
Memphis	TN	Memphis City Schools	-2.66	0.38	0.82	18
Austin	TX	Austin Independent School District	-1.52	0.42	0.59	19
Milwaukee	WI	Milwaukee Public Schools	-4.40	0.66	0.72	20
Boston	MA	Boston Public Schools	-1.95	0.46	0.73	21
Seattle	WA	Seattle Public Schools	0.24	0.19	0.31	22
Charlotte	NC	Charlotte-Mecklenburg Schools	-0.69	0.29	0.43	23
Nashville	TN	Nashville-Davidson City Public Schools	-1.22	0.32	0.43	25
Fort Worth	TX	Fort Worth Independent School District	-1.53	0.53	0.70	27
Denver	CO	Denver Public Schools	-1.70	0.51	0.68	29
Tucson	AZ	Tucson Unified School District [1]	0.08	0.34	0.47	31
New Orleans	LA	New Orleans Public Schools	-1.98	0.70	0.92	32
Long Beach	CA	Long Beach Unified Public School District	-0.88	0.64	0.58	34
Virginia Beach	VA	Virginia Beach City Public Schools	0.26	0.17	0.26	35
Las Vegas	NV	Clark County School District	-0.39	0.27	0.33	37
Sacramento	CA	Sacramento City Unified School District	-0.47	0.59	0.43	38
Fresno	CA	Fresno Unified School District	-1.16	0.62	0.53	39
Atlanta	GA	Atlanta Public Schools[1]	-0.87	0.74	0.92	40
Miami	FL	Miami-Dade County Public Schools	-1.77	0.53	0.84	44
Mesa	AZ	Mesa Unified School District [1]	1.00	0.19	0.19	45
Oakland	CA	Oakland Unified School District	-1.31	0.60	0.73	46
Minneapolis	MN	Minneapolis Public Schools	-3.40	0.54	0.45	47
Colorado Springs	CO	Colorado Springs Public Schools	0.12	0.23	0.23	48
Pittsburgh	PA	Pittsburgh Public Schools	-1.80	0.42	0.56	49

[1]Common Core (1995) indicates this is the largest public school district in a city that is served by multiple school districts.

NOTE: Data unavailable for 11 cities.

districts, Miami and Naperville, is much larger than the gap between the United States and Singapore, the highest scorer on the test.

How are big city districts doing on state tests?

The TIMSS Benchmark study only included a small number of school districts in the United States. How are students performing in other big city districts? We used state tests from the 1999-2000 academic year to estimate how urban schools compete with rural and suburban schools in the same state. We collected data from twenty-one states, created a composite score combining performance in fourth grade reading and eighth grade math, and computed a z-score for each state's districts. Z-scores are expressed in standard deviation units and report a district's performance relative to the state average. Districts scoring one standard deviation above their state's mean have z-scores of +1.00, one standard deviation below the mean, -1.00. The endnotes provide additional information on how these calculations were made.[32]

Table 11 displays the year 2000 performance of districts in the nation's fifty largest cities, rank-ordered by population. A few caveats. Conjuring these scores into a competition that pits city against city is inappropriate. Even in the same subjects, state tests vary in what they assess and how they assess it. Districts differ on factors that influence achievement, such as the proportion of students in poverty or of students lacking English proficiency. They differ on how many students are excluded from testing and the reasons for doing so. And, since the scores presented here reflect relative performance—each district in comparison to other districts in the same state—it is important to note that the comparison groups are vastly different from state to state. A low scoring district in a high achieving state may be performing at a level similar to the average district in a low achieving state. This is the

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problem of comparing big and little fishes swimming in lots of big and little ponds.

Despite these limitations, the data are useful. They accurately depict how districts in each state are judged by the public when test scores are released. They also show the magnitude of the task of turning around many urban districts. Table 11 is dominated by minus signs. Thirty-one of these cities, about 80%, score below their state average (z-score of 0.00); twenty-four (62%) have z-scores below -1.00, and ten (26%) have z-scores below -2.00. Only eight cities, 21%, score at or above their state average, and six of these have fewer than 40% of students qualifying for free and reduced lunch, approximately the national figure for elementary school students.

Achievement of Poor Urban School Districts in Selected States, 2000

Table 12

State	Districts	Average Z-Score	Standard Error	% Free Lunch	% Black + Hispanic
North Carolina	1	+0.26	—	0.40	0.57
Florida	6	-0.43	0.30	0.45	0.43
Louisiana	6	-0.53	0.37	0.55	0.62
Arizona	10	-0.65	0.20	0.52	0.73
Georgia	7	-0.72	0.11	0.56	0.69
Texas	44	-0.72	0.17	0.59	0.75
California	64	-0.75	0.07	0.63	0.51
Washington	2	-0.98	0.40	0.44	0.41
Colorado	2	-1.10	0.60	0.46	0.60
Virginia	9	-1.24	0.25	0.50	0.64
New York	12	-1.88	0.20	0.53	0.49
Illinois	4	-1.89	0.17	0.51	0.76
Massachusetts	4	-2.05	0.37	0.50	0.72
Pennsylvania	8	-2.05	0.44	0.48	0.50
Michigan	18	-2.09	0.22	0.56	0.67
Indiana	6	-2.27	0.38	0.53	0.56
Maryland	1	-2.73	—	0.65	0.85
Minnesota	2	-3.31	0.08	0.52	0.36
Wisconsin	1	-4.41	—	0.66	0.72

CRITERIA: At least 50 students in grades tested.
Percentage of students in the federal free lunch program ≥ 40%.

Are urban districts serving poor children doing better in some states?

Table 12 casts a wider net. We first identified all districts coded as "large central city" or "midsize central city" in the U.S. Department of Education's Common Core of Data, a compilation of data on every school district in the country. It includes districts from thousands of smaller cities not shown in Table 11. After computing z-scores for achievement in the manner described above, we narrowed the list to districts with at least 40% of students qualifying for free lunch. This eliminated a few affluent "island" districts located in metropolitan areas. We then calculated state means and rank-ordered the states by average z-score. Table 12 shows, on a state-by-state basis, the relative achievement of urban districts serving substantial numbers of poor children.[33]

A single characteristic leaps out. Sun Belt states dominate the top of the list. But note that poor urban districts in Florida, the highest ranked state with more than one district meeting our criteria, still score .43 standard deviations below the state average.

Why do urban districts in the Sun Belt seem to do better?

To determine why the states fall as they do in Table 12 would require several steps beyond the scope of the current study. Let's start with achievement data. Ideally, tests scores from several years would be available, both to estimate how much academic growth districts are able to produce—as opposed to scores from a single point in time, as presented here—and to minimize the possibility of an anomalous year distorting test scores. The tests that states employ should be scrutinized to see if the type of test influences urban districts' relative rankings. A survey of district and state systems of finance and governance would be needed, along with an inventory of state and local education policies to pinpoint educational activities that promote and depress achievement.

That said, reasonable hypotheses for why the top seven states in this analysis are in the Sun Belt include:

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Compared to the rest of the nation, Sun Belt states spend less per pupil but distribute funds more equitably among districts.

Policies

Southern states were first out of the blocks with standards and testing when the accountability movement started in the 1980s. Florida, Texas, and Louisiana make students pass an exit exam before graduating from high school. California and Arizona will start doing so in the next few years. Six of the top seven states, Arizona being the exception, have a legacy of strong state influence over the curriculum, most notably through curriculum frameworks and textbook adoptions. Arizona leads the nation in charter schools. Compared to the rest of the nation, Sun Belt states spend less per pupil but distribute funds more equitably among districts. These policies may narrow achievement gaps between urban and suburban districts.[34]

Governance

As a general rule of educational governance, the Sun Belt has more centralization at the state level and more dispersed governance locally. Several urban areas in the South and West feature a batch of small school districts surrounded by a few large suburban districts. Phoenix has twenty-four districts within its city limits. The state's largest district is located in nearby Mesa. Big cities in the Rust Belt, on the other hand, are often served by a single large city district ringed by dozens of smaller suburban districts. This pattern arose from a tradition of strong municipal governments in the East and Midwest and weak municipal governments in the West and South. Hoxby (1995) found that areas with more school districts gain an achievement advantage because districts must compete for homebuyers. When people shop for new homes, the quality of local schools is crucial. Parents are also shopping for school districts. That choice is limited in the Rust Belt's big cities.[35]

Demographics

The nature of urban areas varies by region. Redding, CA, a city of 164,000 near Mt. Shasta in Northern California, will not strike many Easterners as a typical urban area. Even in more populated Western areas, visitors are often surprised to discover urban communities without skyscrapers. In the Los Angeles area, Watts, South Central, and East Los Angeles are neighborhoods consisting of single-family houses. Racial and ethnic populations also vary by region, with Hispanic and Asian immigrants more prevalent in the Sun Belt. And whereas many urban districts in the East and Midwest have declined in population over the past few decades, the Sun Belt's urban districts have experienced sharp growth.

Test artifacts

The findings may be spurious. Urban Sun Belt districts serve large numbers of students lacking English proficiency. If these students are excluded from testing, a district's standing relative to the state average may be artificially boosted. Non-English speaking students in Texas take a Spanish version of the TAAS from second to sixth grade. Their scores are published separately and were not used in the analysis.

From 1998 to 2000, California and San Francisco education officials fought in court over whom would be tested in the state's testing program. San Francisco refused to administer the SAT-9 to bilingual program students who had been in the district for thirty months or less. San Francisco lost the legal battle and was ordered to include all students in SAT-9 testing. The court order was issued after 2000 testing had been completed, however. In producing the scores analyzed here, San Francisco played by its own rules, followed by no other California district taking the SAT-9. If significantly more English language learners are included in San Francisco's testing in 2001, scores may drop.[36]

What are the most prevalent strategies for improving urban schools?

In the 1990s, all levels of government—federal, state, and local—adopted policies focused on improving urban schools. Traditionally, helping urban schools involved directing more resources their way, either through federal programs, especially Title I, or by reducing funding disparities among school districts within the same state. In the 1990s, new strategies emerged. These strategies fall into three broad categories: choice, standards, and class size reduction.

Choice

Charter school legislation has been adopted in thirty-seven states, with nearly 2,000 charters in operation during the 2000-2001 academic year. Publicly-funded vouchers are provided to several thousand poor children in Milwaukee, Cleveland, and the state of Florida. The privately-funded Children's Scholarship Fund annually supplies 40,000 poor urban students with scholarships to attend private schools in dozens of cities.

Achievement in charter schools has thus far proven difficult to evaluate. Most charters are too new to have generated definitive data. Others serve special populations, such as students at risk or dropouts, skewing results.[37]

Although controversial, research generally shows positive effects for students using vouchers to attend private schools. Effects are limited, however. Vouchers tend to benefit elementary students rather than students in middle and high schools and African-American children rather than Hispanic or white children. Vouchers also tend to improve math performance instead of achievement in reading or other subjects.[38]

Standards

Virtually every state in the union has adopted academic standards and an assessment system for measuring student learning. Standards vary in quality, especially in terms of clearly spelling out what students should know and when they should know it. Assessments also differ, with some states purchasing off-the-shelf commercial tests and other states developing their own, criterion-referenced tests keyed to state standards. Several big city school districts (Boston, Chicago, Houston, Philadelphia) have adopted their own sets of standards and criteria for student promotion from grade to grade.[39]

Evidence on the effect of standards is sparse, and in the short term it will probably remain so. David Grissmer of RAND found that Texas and North Carolina made significant progress on NAEP tests in the 1990s and attributed the states' success to having established accountability systems backed by rigorous standards. Gains were particularly impressive for poor and minority students. It is almost impossible to isolate the effects of standards from the effects of other reforms implemented concurrently. If while putting standards into effect states also impose new requirements for teacher training, limit or reduce class sizes, adopt new textbooks, and raise teachers salaries, it could be any, all, or none of these policies that produce changes in test scores. Add the local policies of urban districts to the mix, and determining causality becomes even more difficult.[40]

Reducing Class Size

In the 1990s, the STAR experiment in Tennessee triggered strong public interest in reducing class size. The experiment randomly assigned students to small classes and tracked student learning for several years. Researchers found that small classes significantly boost achievement, especially of African-American

An important lesson from the last century of schooling is that at almost every level of education, from classrooms to nations, failure begets failure.

students and primarily in the early grades. California poured billions of dollars into a class size initiative for the early elementary grades, and a federal program was adopted during the Clinton administration, targeted primarily at urban districts.[41]

Alan Krueger's recent re-analysis of the Tennessee data confirms the benefit of small classes for African-Americans. The California effort has raised cautions, however, especially in terms of unintended consequences for urban schools. Reducing the size of classes in suburban districts opened up job openings for teachers. As urban districts lost experienced teachers who left for the suburbs, they hired inexperienced, and frequently, non-credentialed teachers to replace them. Statewide class size reductions should be implemented while keeping an eye on the teacher labor market, perhaps phased-in slowly to lessen any unforeseen ill effects.[42]

Conclusion

These reforms are promising, but we don't yet know if they will succeed or fail. The challenge is great. An important lesson from the last century of schooling is that at almost every level of education, from classrooms to nations, failure begets failure. The history of urban schools in the past few decades is grim evidence of that fact. But the flip side is also true, higher achievement feeds on itself. Turning around our urban school systems ultimately would mean more than improving education. It would have a profound impact on the social welfare of the nation.

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ENDNOTES

1 Main NAEP reading tests have remained substantially the same from 1992 to 2000. See P.L. Donahue, R.J. Finnegan, A.D. Lutkus, N.L. Allen, and J.R. Campbell, U.S. Department of Education, *The Nation's Report Card: Fourth-Grade Reading 2000*, (NCES 2001-499, U.S. Government Printing Office, 2001), p. 2.

2 Tom Loveless, *The Brown Center Report on American Education*, (The Brookings Institution, 2000), p. 8.

3 For effect of score volatility on school accountability programs, see Thomas J. Kane and Douglas O. Staiger, "Volatility in School Test Scores: Implications for Test-Based Accountability Systems," Paper presented at The Brookings Papers on Education Policy Conference, The Brookings Institution, Washington, DC, May 15, 2001; Also note that scores on the Iowa Test of Basic Skills in the 1990s showed gains in math concepts but declines in computation; Robert L. Linn, "Assessments and Accountability," *Educational Researcher*, vol. 29, no. 2 (March, 2000), pp. 4-16; Loveless, 2000.

4 Richard J. Murnane, *The Impact of School Resources on the Learning of Inner City Children*, (Balinger Publishing Company, 1975); Adam Gamoran, "The Stratification of High School Learning Opportunities," *Sociology of Education*, vol. 60, no. 3 (July, 1987), pp. 135-155.

5 Data obtained from 37 states (and the District of Columbia) for 1998-1999, and 45 states (and the District of Columbia) for 1999-2000. States were categorized as showing improvement, no change, or a decline. Figures 1 and 2 only report improving states. The other states are fairly equally divided between "no change" and "decline." Complete data posted on the Brown Center website at www.brookings.edu/browncenter.

6 Linn, 2000.

7 Ina V.S. Mulis, Michael O. Martin, Eugenio J. Gonzales, Kelvin D. Gregory, Robert A. Garden, Kathleen M. O' Connor, Stephen J. Chrostowski, Teresa A. Smith, *TIMSS 1999 International Mathematics Report: Findings from IEA's Repeat of the Third International Mathematics and Science Study at the Eighth Grade*, (Center for the Study of Testing, Evaluation, and Educational Policy, Boston College, 2000), p. 206.

8 Note that U.S. responses for "never" are statistically not significantly different from those of Singapore (based on two-sample test of differences).

9 Gary Phillips press release (April 6, 2001) obtained from the following page on the NCES website: nces.ed.gov/whatsnew/ncesnews.asp; "Paige Releases NAEP Results Showing Need To Improve Reading Skill," *The White House Bulletin*, April 6, 2001.

10 Paul E. Barton, "Raising Achievement and Reducing Gaps: Reporting Progress Toward Goals for Academic Achievement," A Report to the National Education Goals Panel (NEGP), March, 2001, p. 48; Kate Zernike, "Test Results from States Reveal Gaps in Learning," *The New York Times*, April 9, 2001, *The New York Times* online archives: www.nytimes.com ; Kathleen Kennedy Manzo, "4th Graders Still Lag on Reading Test," *Education Week*, April 11, 2001, *Education Week* online archives: www.edweek.com/edsearch.cfm ; Michael A. Fletcher, "Test Shows Wider Gap in Reading Skills," *Washington Post*, April 7, 2001, p. A2.

11 Manzo, 2001.

12 Of the three year-to-year changes in the gap, only the five point change from 1998 to 2000 falls short of statistical significance. And it's close. The standard error of the 1998-00 gap change is 2.73, meaning any change greater than 5.46 would have been significant.

13 U.S. Department of Education, National Center for Education Statistics, "1998 Reading Results for Low-Performing Students," *NAEP Facts*, vol. 4, no. 4 (May, 2000).

14 Population changes in the top and bottom groups of test scorers were not controlled in this analysis, nor in the studies conducted by NCES and NEGP. The scores are unadjusted for poverty, native language, and other background characteristics of students. If the proportion of children who are poor or non-English speaking grew in the bottom decile of readers, that could widen the gap.

15 "Millions of Kids Flock to High Schools," *Associated Press*, (May 23, 2001); U.S. Department of Education, National Center for Education Statistics, *Digest of Educational Statistics, 2000*, (NCES 2001-034, U.S. Government Printing Office, 2001), p. 12.

16 U.S. Department of Education, National Center for Education Statistics, *Digest of Educational Statistics, 2000*, (NCES 2001-034, U.S. Government Printing Office, 2001), pp. 12, 48-49.

17 On the word "teenager," see *Webster's Encyclopedic Unabridged Dictionary of the English Language*, (Random House, 1996); On the perception of childhood and adolescence, see Philippe Aries, *Centuries of Childhood*, (Random House, 1965); On U.S. rural population in 1880, see U.S. Census Bureau, "Population and Housing Unit Counts, Table 4. Population 1790 to 1990," U.S. Census Bureau online data: www.census.gov/population/censusdata/table-4.pdf.

18 Robert S. Lynd and Helen Merrell Lynd, *Middletown*, (Harcourt, Brace & World, Inc., 1929).

19 James S. Coleman, *The Adolescent Society*, (The Free Press, 1961).

20 Coleman, 1961, pp. 305-309.

21 Laurence Steinberg, *Beyond the Classroom*, (Simon and Schuster, 1996).

22 Barbara Schneider and David Stevenson, *The Ambitious Generation, America's Teenagers, Motivated but Directionless*, (Yale University Press, 1999). Also see *The Adolescent Years: Social Influences and Educational Challenges*, edited by Kathryn Borman and Barbara Schneider, (University of Chicago Press, 1998).

23 Margins of error reported at the 95% confidence level.

24 For FIGURE 7: Regarding the estimate of homework in the United States, we dropped about one-fourth of the exchange students because they were not taking a math class in the U.S. (n=279).

25 In addition to the authors cited in the text, the importance of academic press in school culture is stressed by Anthony S. Bryk, Valerie E. Lee, and Peter B. Holland, *Catholic Schools and the Common Good*, (Harvard University Press, 1993).

26 For FIGURE 8: We conducted a separate analysis excluding the students who did not take a math class in the U.S. These results were similar: much less, 18.8%; a little less, 28.5%; about the same, 37.9%; a little more, 11.6%; much more, 3.3%.

27 National Commission on The High School Senior Year, *The Lost Opportunity of Senior Year: Finding a Better Way (Preliminary Report)*, (National Commission on The High School Senior Year, 2001).

28 Richard Hofstadter, *Anti-Intellectualism in American Life*, (Random House, 1962).

29 Howard Gardner, "Low Scores Are No Disgrace," *The New York Times*, March 2, 1998, p. A17.

30 Gaps in other subjects and grade levels generally follow the pattern of 4th grade reading, but there are differences. See U.S. Department of Education, Office of Educational Research and Improvement, National Center for Education Statistics, *NAEP 1999: Trends in Academic Progress*, by J. R. Campbell, C. M. Hombo, and Jane Mazzeo, (NCES 2000-469, U.S. Government Printing Office, 2001).

31 Caroline M. Hoxby, "If Families Matter Most, Where Do Schools Come In?" Paper presented at the Koret Task Force Meeting, The Hoover Institution, Palo Alto, CA, February 10, 2000.

32 For TABLE 11: Some states tested different grades (9 of 21 states). When necessary, we substituted 3rd or 5th grade to get a reading score, 6th or 7th grade to get a math score. Some districts serve only the lower grades (3,4, or 5) or only the higher grades (6,7, or 8). We dropped these districts from the analysis, as well as those districts with less than 50 students. The score for New York City Public Schools is a composite score for all districts that fall under the control of the New York City Board of Education. Also note that the Council of the Great City Schools recently analyzed achievement of their member urban school districts. See Council of the Great City Schools, *Beating The Odds: A City-By-City Analysis of Student Performance and Achievement Gaps on State Assessments*, by Michael Casserly, (Council of the Great City Schools, 2001).

33 For TABLE 12: State averages are only for urban districts that met our criteria for poverty. Demographic variables were obtained from U.S. Department of Education, National Center for Education Statistics, *Local Education Agency (School District) Universe Survey Longitudinal Data File: 1986-1997*, Common Core of Data (CCD), CCD Information on public Schools and School Districts in the United States: nces.ed.gov/ccd/ccd12yragency.html.

34 Education Week, *Quality Counts '98: The Urban Challenge*, (January, 1998), pp. 100-101.

35 For effects of competition among public schools, see Caroline M. Hoxby, "Does Competition Among Public Schools Benefit Students and Taxpayers?" *American Economic Review*, Vol. 90, No. 5 (December 2000), pp. 1209-1238.

36 Mary Ann Zehr, "California Settles Battle Over LEP Testing," *Education Week*, November 22, 2000, *Education Week* online archives.

37 See Center on Reinventing Public Education, *A Study of Charter School Accountability*, (U.S. Department of Education, 2001).

38 Paul E. Peterson and David E. Campbell, "An Evaluation of the Children's Scholarship Fund," (Program on Education Policy and Governance, Harvard University, 2001); William G. Howell, Patrick J. Wolf, Paul E. Peterson, and David E. Campbell, "Test-Score Effects of School Vouchers in Dayton, Ohio, New York City, and Washington, DC: Evidence from Randomized Field Trials," Paper presented at the annual meeting of the American Political Science Association, Washington, DC, September 2000.

39 Education Week, *Quality Counts 2001: A Better Balance; Standards, Tests, and The Tools to Succeed*, (January, 2001).

40 David W. Grissmer, Ann Flanagan, Jennifer Kawata, and Stephanie Williamson, *Improving Student Achievement: What State NAEP Test Scores Tell Us*, (The RAND Corporation, 2000).

41 Frederick Mosteller, Richard J. Light, and Jason A. Sachs, "Sustained Inquiry in Education: Lessons from Skill Grouping and Class Size," *Harvard Educational Review*, vol. 66, no.4 (Winter, 1996), pp. 797-842.

42 Alan B. Krueger and Diane M. Whitmore, "Would Smaller Classes Help Close the Black-White Achievement Gap?" Paper presented at the Closing The Gap: Promising Approaches to Reducing the Achievement Gap Conference, The Brookings Institution, Washington, DC, February 2, 2001. For more information on the effects of class size reduction in California, see *Class Size Reduction in California: The 1998-99 Evaluation Findings*, (Class Size Reduction Research Consortium, 1999), www.classize.org/techreport/index-00.htm; Randy Ross, "How Class Size Reduction Harms Kids in Poor Neighborhoods," *Education Week*, May 26, 1999, *Education Week* online archives: www.edweek.com/edsearch.cfm.

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ADDENDA 1
State Test Results (1998-1999)
Reading

	Grade 4	Grade 5	Grade 8	Grade 10
Improvement -	15 (68%)	13 (72%)	15 (52%)	13 (59%)
No Change «	4 (18%)	3 (17%)	7 (24%)	4 (18%)
Decline –	3 (14%)	2 (11%)	7 (24%)	5 (23%)
Total	22	18	29	22

NOTE: Data obtained from 37 states (and the District of Columbia) that administered the same achievement test in 4th grade, 5th grade, 8th grade, or 10th grade; in either Math or Reading.

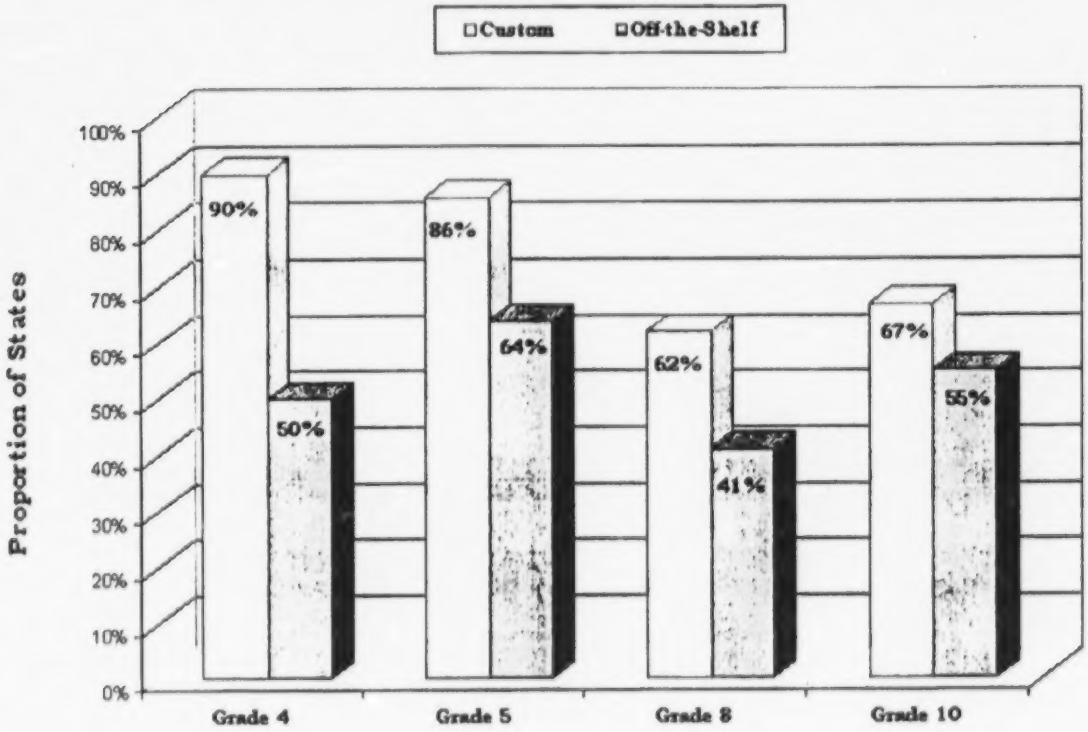
ADDENDA 2
State Test Results (1999-2000)
Reading

	Grade 4	Grade 5	Grade 8	Grade 10
Improvement ↑	14 (44%)	13 (59%)	15 (42%)	11 (46%)
No Change ↔	10 (31%)	3 (14%)	10 (28%)	6 (25%)
Decline ↓	8 (25%)	6 (27%)	11 (31%)	7 (29%)
Total	32	22	36	24

NOTE: Data obtained from 45 states (and the District of Columbia) that administered the same achievement test in 4th grade, 5th grade, 8th grade, or 10th grade; in either Math or Reading.

ADDENDA 3

States Reporting Gains in Reading (1998 - 1999)



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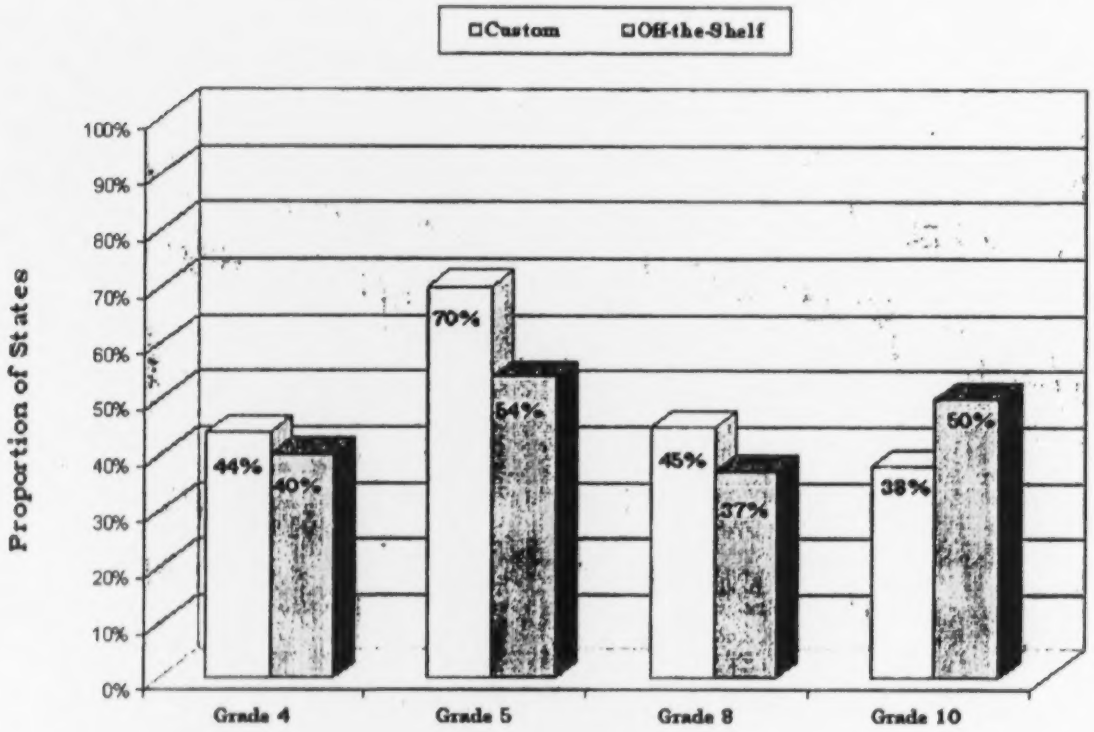

ADDENDA 5
State Test Results (1998-1999)
Math

	Grade 4	Grade 5	Grade 8	Grade 10
Improvement ↑	19 (86%)	15 (79%)	19 (63%)	13 (54%)
No Change ↔	1 (5%)	2 (11%)	6 (20%)	3 (13%)
Decline ↓	2 (10%)	2 (11%)	5 (17%)	8 (33%)
Total	22	19	30	24

NOTE: Data obtained from 37 states (and the District of Columbia) that administered the same achievement test in 4th grade, 5th grade, 8th grade, or 10th grade; in either Math or Reading.

ADDENDA 6
State Test Results (1999-2000)
Math

	Grade 4	Grade 5	Grade 8	Grade 10
Improvement ↑	18 (62%)	15 (63%)	29 (78%)	20 (80%)
No Change ↔	5 (17%)	7 (29%)	4 (11%)	4 (16%)
Decline ↓	6 (21%)	2 (8%)	4 (11%)	1 (4%)
Total	29	24	37	25

NOTE: Data obtained from 45 states (and the District of Columbia) that administered the same achievement test in 4th grade, 5th grade, 8th grade, or 10th grade; in either Math or Reading.

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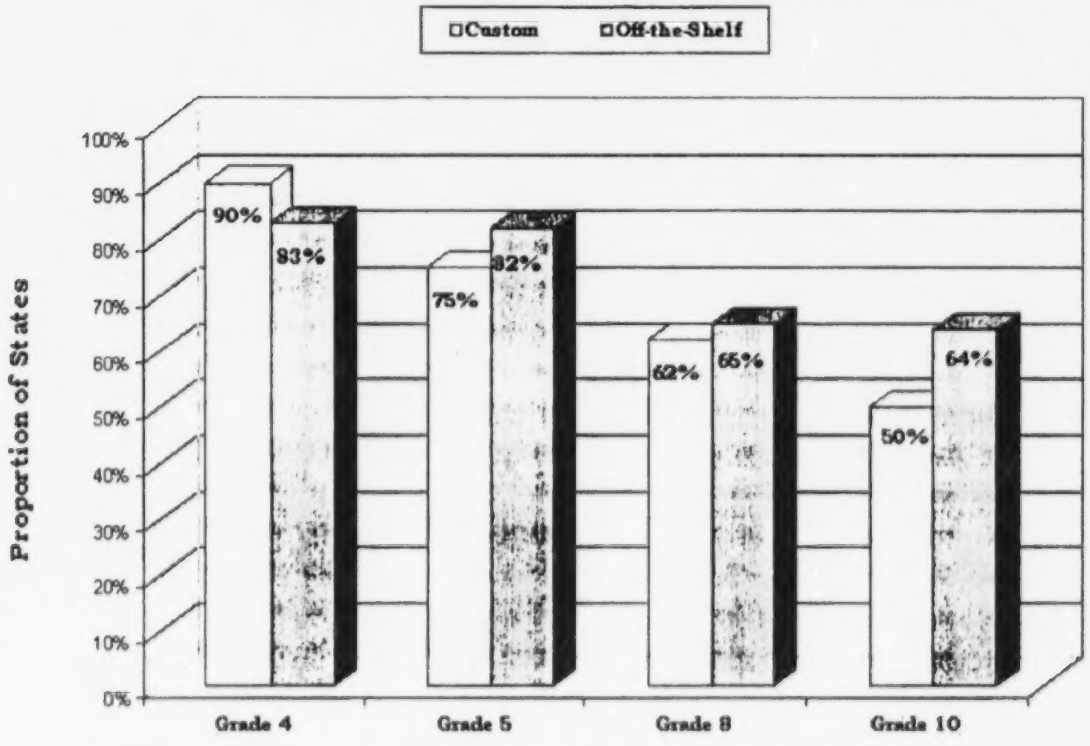
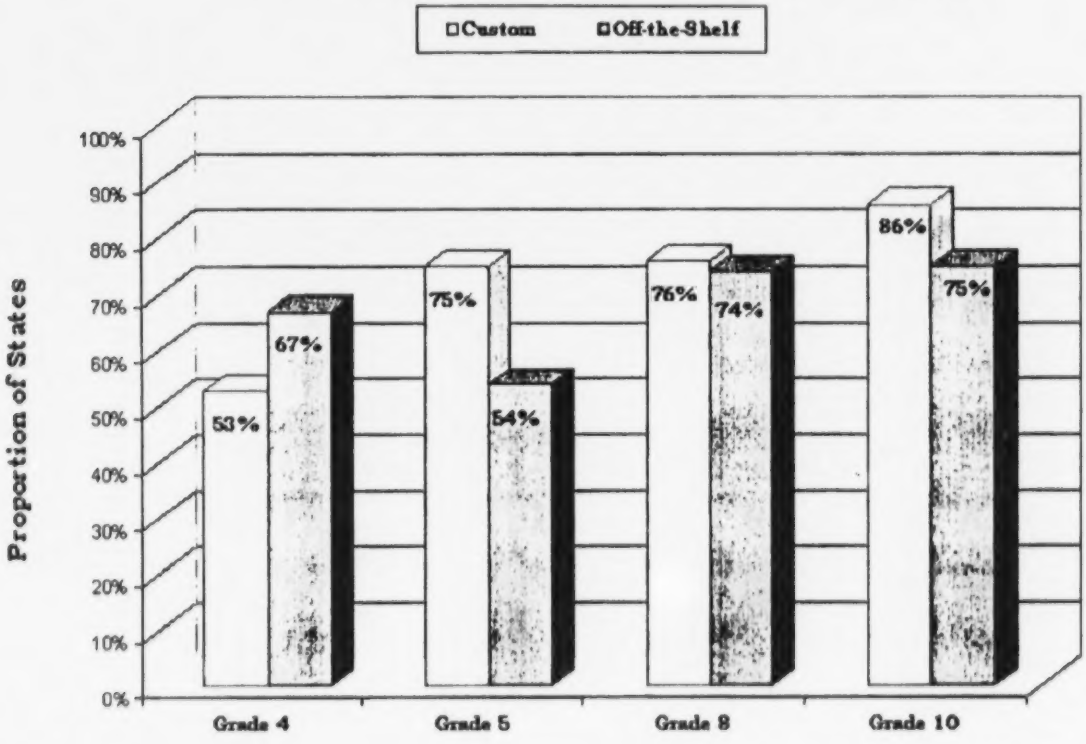
ADDENDA 7

States Reporting Gains in Math (1998 - 1999)



ADDENDA 8
States Reporting Gains in Math (1999 - 2000)



ADDENDA 9

Common Core (1995) counts of cities in each state:

STATE	Code = 1	Code = 2	Total Districts	% Code = 1 or 2
AZ	22	5	116	23%
CA	26	74	570	18%
CO	6	7	86	15%
FL	3	13	67	24%
GA	1	6	173	4%
IL	3	26	505	6%
IN	9	24	281	12%
LA	1	8	66	14%
MD	1	2	24	13%
MA	2	19	215	10%
MI	14	62	628	12%
MN	2	4	229	3%
NV	1	1	16	13%
NY	3	34	548	7%
NC	1	16	119	14%
PA	11	38	488	10%
TN	2	9	128	9%
TX	40	57	623	16%
VA	2	13	131	11%
WA	4	24	186	15%
WI	3	17	172	12%

ADDENDA 10

Small Districts by State

	Students/grade < 50		Students/grade < 100	
State	#	% of State	#	% of State
AZ	56	33%	78	45%
CA	149	21%	256	36%
CO	53	38%	78	55%
FL	0	0%	3	5%
GA	3	2%	17	10%
IL	259	34%	465	60%
IN	10	3%	73	25%
LA	0	0%	0	0%
MA	15	7%	40	17%
MD	0	0%	0	0%
MN	84	27%	176	56%
NY	95	15%	246	38%
PA	12	2%	90	18%
TN	4	3%	9	14%
TX	362	37%	572	58%
VA	1	1%	17	13%
WA	109	37%	159	54%
WI	27	14%	71	36%

ADDENDA 11
High-performing Urban School Districts, 2000

State	School District	Metro Area	Z Score	% Free Lunch	% Black + Hispanic
AZ	Alhambra ESD	Phoenix	0.52	0.53	0.51
AZ	Wilson ESD	Phoenix	0.02	0.54	0.92
CA	Live Oak Elementary	Santa Cruz	0.19	0.42	0.30
CA	Redding Elementary	Redding	0.22	0.53	0.07
CA	San Francisco Unified	San Francisco	0.25	0.65	0.38
CA	San Jose Unified	San Jose	0.00	0.43	0.51
CA	Santa Clara Unified	Santa Clara	0.32	0.40	0.29
FL	Hillsborough County	Tampa	0.42	0.41	0.41
LA	Rapides Parish	Alexandria	0.48	0.48	0.41
LA	Terrebonne Parish	Houma	0.20	0.44	0.26
NC	Nashville-Rocky Mount Schools	Nashville	0.26	0.40	0.57
TX	Anthony ISD	Anthony	0.19	0.71	0.95
TX	Denison ISD	Denison	0.86	0.40	0.15
TX	Galena Park ISD	Galena Park	0.21	0.52	0.70
TX	Liberty-Elau ISD	Texarkana	0.31	0.45	0.42
TX	McAllen ISD	McAllen	0.05	0.56	0.87
TX	Roosevelt ISD	Lubbock	0.28	0.49	0.40
TX	San Benito Consolidated ISD	San Benito	0.01	0.75	0.97
TX	San Marcos Consolidated ISD	San Marcos	0.60	0.48	0.66
TX	Sharyland ISD	Mission	0.29	0.46	0.77
TX	Spring Branch ISD	Houston	0.05	0.45	0.50
TX	Ysleta ISD	El Paso	0.51	0.58	0.87

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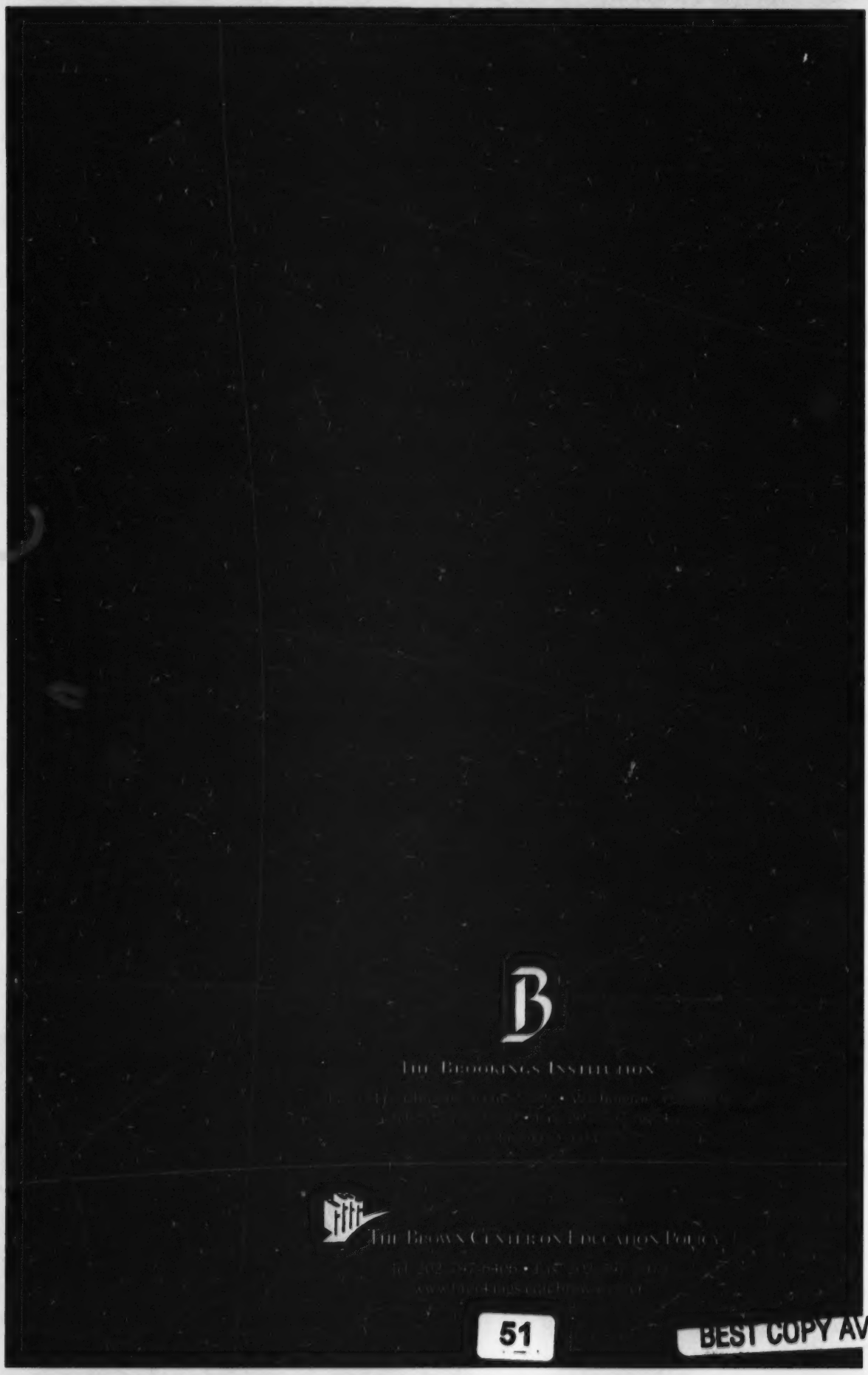

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